PERMYAKOV, V.A., kand.tekhn.nauk; DANILENKOVA, N.I., inzh.; LEBEDEV, V.V., inzh.

Use of models for studying the aerodynamics of the gas channels of TP-90 and TP-100 boilers with T-shaped arrangement of the components. Teploenergetika 8 no.5:45-52 My '61. (MIRA 14:8)

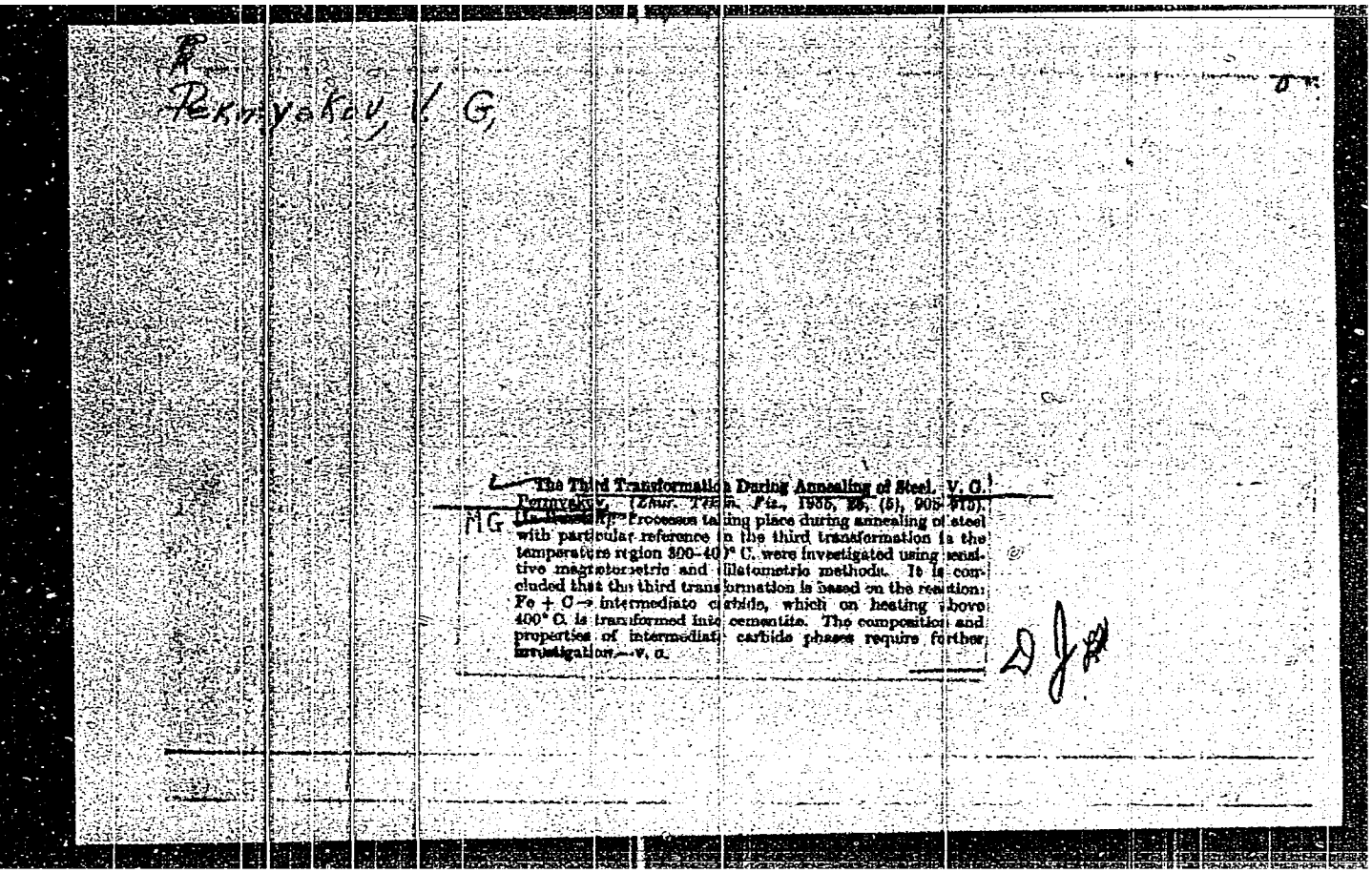
1. TSentral'nyy nauchno-issledovatel'skiy kotloturbinnyy institut imeni I.I.Polzunova i Turbinno-kotel'nyy zavod.
(Boilers)

POPOV, A.A., kandidat tekhnicheskikh nauk; SHKLYAR, R.Sh., inzhener; PERMYAKOV, V.G.

Determination of austenite by magnetic saturation. Zav.lab. 21 no.6:677-686 '55. (MLRA 8:9)

1. Ural'skiy politekhnicheskiy institut im. S.M.Kirova(for Popov, Shklyar). 2. Dotsent Kiyevskogo politekhnicheskogo institua (for Permyakov)

(Austenite) (Magnetic testing)



Perkyakov, I. G.

The Third Transformation During Annealing of Steel. V. G. Pervukhin, I. G. Perkyakov. (Zhur. Tekh. Fiz., 1935, 5, (5), 905-915).

Processes taking place during annealing of steel with particular reference to the third transformation in the temperature region 300-400° C. were investigated using sensitive magnetometric and dilatometric methods. It is concluded that the third transformation is based on the reaction: Fe + C → intermediate carbide, which on heating above 400° C. is transformed into cementite. The composition and properties of intermediate carbide phases require further investigation.—V. G.

PERMYAKOV, V. G.

Category : USSR/Solid State Physics - Phase Transformation in Solid Bodies E-5

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6653

Author : Permyakov, V.G.
Title : Investigation of the Tempering Processes in an Iron-Nitrogen System.

Orig Pub : Metallovedeniye i obrabotka metallov, 1956, No 7, 2-9

Abstract : A study was made of the structure of commercial iron, hardened after nitriding at 600 -- 900°, and its variations in tempering. Microphotographs are given, as are microhardness, dilatometric, and magnetometric data which are in good agreement with each other. The nitrided austenite and martensite obtained in the nitride layer (with characteristic needle-like structure) and observations of the changes occurring in them during heating have disclosed a far-reaching analogy between the tempering of hardened iron-nitride and iron-carbide alloys: the tempering begins with the decomposition of the martensite, on which is superimposed at 190 -- 310° the decomposition of the residual austenite; as a result

Card : 1/2

KIEV OL Polytech. Inst.

PERMYAKOV, V.E.

PERMYAKOV, V.G.; BELOUS, M.V.

Dilatometer for investigating phase transformations in alloys.
Zav.lab. 22 no.10:1251-1252 '56. (MLRA 10:5)

1.Kiyevskiy politekhnicheskiy institut.
(Dilatometer) (Alloys)

PETROSYAN, Petr Pavlovich; PERMYAKOV, V.G., kandidat tekhnicheskikh nauk, retsenzent; SERDYUK, V.K., inzhener, redaktor;

[Heat treatment of steel by chilling] Termicheskaia obrabotka stali kholodom; teoriia i praktika. Kiev, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1957. 121 p. (MLRA 10:5)
(Steel--Heat treatment) (Metals at low temperature)

126-3-15/34

AUTHORS: Permyakov, V.G. and Belous, M.V.

TITLE: Carbide transformations during tempering of steel. (Karbidnyye prevrashcheniya pri otpuske stali).

PERIODICAL: "Fizika Metallov i Metallovedeniye" (Physics of Metals and Metallurgy), 1957, Vol.4, No.3, pp. 490-499 (U.S.S.R.)

ABSTRACT: The most detailed investigation of the state of the carbide phase was carried out by Kurdyumov, G.V. and his team (1-3) between 1939 and 1947. They found that at a tempering temperature below 300 C carbide forms in iron which differs in composition and properties from that of cementite but they could not establish the composition of the low temperature carbide. Isaichev, I.V. (5) found that this carbide is unstable and becomes transformed into intermediate "rhombic carbide" on heating above 300 C and then into cementite. N. M. Popova (5-8) and M.F. Abruzov (9) arrived at the conclusion that only cementite forms at all tempering temperatures and the difference between the carbide phases forming at various tempering temperatures consists solely in the differing degree of dispersion and also in the differing bond with the basic phase; the conclusion of these authors is contradicted by later Soviet and foreign results (11-15). In an earlier paper of one of the authors (12) the

Card 1/2

APAYEV, B.A.; BELOUS, M.V.; PERMYAKOV, V.G.

Calculating the additive properties of alloys during quantitative phase analysis. Fiz. met. i metalloved. 17 no.2:289-292 F '64. (MIRA 17:2)

1. Kiyevskiy politekhnicheskiy institut i Gor'kovskiy fiziko-tekhnicheskiy institut.

BELOUS, M.V.; GRANKINA, L.P.; PERMYAKOV, V.G.; SEVERYANINA, Ye.N.

Electric properties of thin nichrome films. Fiz. met. i metalloved. 16 no.5:669-674 N '63. (MIRA 17:2)

1. Kiyevskiy politekhnicheskiy institut.

AUTHOR: Permyakov, V.G. 129 - 8 - 3/16

TITLE: Magnetic study of the tempering of nitrided iron and steel. (Magnitnoe issledovanie otpuska azotirovannogo zheleza i stali).

PERIODICAL: "Metallovedeniye i Obrabotka Metallov" (Metallurgy and Metal Treatment), 1957, No.8, pp. 15-16 (U.S.S.R.)

ABSTRACT: Several authors established that there is an analogy between the processes of tempering in the systems Fe - N and Fe - C extending to the decomposition of martensite and of residual austenite. Less attention has been paid to the behaviour of nitride or carbo-nitride phases and in this paper an attempt is made to compare the processes of tempering of carbon steel with tempering of nitride-hardened iron and of nitrided steel using a magnetic method. The tests were carried out on iron containing 0.02% C and on steel Y8A, using specimens in the form of hollow cylinders 30 mm long, 3 mm dia. and 0.4 mm wall thickness. Nitriding was effected at 800 - 850 C for 8-12 hours with subsequent annealing for 6 minutes, without feeding ammonia into the furnace, followed by quenching in oil. After such treatment, the specimens consisted of almost only martensite and residual austenite without any nitride ε-phase. Depending on the conditions of nitriding, the average N content

Card 1/2

There are 2 figures, 5 references, of which 4 are Slavic.

ASSOCIATION: Kiev Polytechnical Institute (Kievskiy Politekhnicheskiy Institut)

AVAILABLE:

Card 2/2

SOV/137-58-9-20167

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 9, p 292 (USSR)

AUTHORS: Kocherzhinskiy, Yu.A., Permyakov, V.G.

TITLE: Magnetometric Investigation of the Dissolution of Cementite Upon the Electrical Heating of U8 Grade Steel (Magnitometricheskoye issledovaniye rastvoreniya tsementita pri elektronagreve stali U8)

PERIODICAL: Sb. nauchn. rabot In-ta metallofiz. AN UkrSSR, 1957, Nr 8, pp 44-50

ABSTRACT: To investigate the process of the dissolution of cementite (C) upon electrical heating it is proposed that a magnetometric method, based upon the measurement of the intensity of the magnetic effect in the point A_0 be used. It is evident that upon the passing of C into solid solution the effect at the point A_0 must decrease. The investigation was conducted on a wire 1.7 mm in diam of the following composition (in %): C 0.76, Mn 0.24, Si 0.32, P 0.012, S 0.014 with an initial lamellar pearlite structure. Electrical heating at a rate of 45°C/sec and the quenching of the specimens (S) was carried out on a special dilatometer. Preliminary experiments showed that the process

Card 1/2

Magnetometric Investigation of the Dissolution of Cementite (cont.)

of the dissolution of C is accompanied by a decrease in volume. Therefore, the time of the dissolution of C was determined by the time which passed between the beginning of the contraction, which is marked sharply on the dilatometer, and the moment of quenching. It constituted: 0.45, 0.75, 1.94, 4.32, and 5.95 sec. For the quenching, a tube was put over the specimen. After heating for the necessary period of time the current was switched off and a current of water under pressure was passed through the tube which ensured an abrupt quenching. The absolute error in the measurement of time constituted ~0.08 sec. The error caused by the time lag in cooling (the time elapsed between the switching off of the current and the action of the water) was on the average up to 0.04 sec. and $\leq$ 0.30 sec. For the magnetic investigation specimens 22 ± 0.1 mm long were cut out from the wires quenched on the dilatometer. The magnetic measurements were carried out by the differential method developed by V.G. Permyakov, Yu.V. Naydich, and S.A. Rybak (RZhMet, 1956, Nr 5, abstract 4910). To establish the effect in the point A_0 the heating of S was conducted in an oil bath, the temperature of which was measured by a mercury thermometer with a ± 1° precision. It is shown that the data obtained by the magnetometric and the resistometric methods agree satisfactorily. Upon the heating of U8-grade steel with an initial lamellar pearlite structure at the rate of 45°/sec, the time of dissolution of C amounts to ~ 3.5 sec. 1. Steel--Induction heating 2. Steel--Test methods 3. Cementite--Transformations 4. Induction heating --Metallurgical effects

Card 2/2 T.M.

PERMYAKOV, V.G.; BELOUS, M.V.

Carbide transformations during steel tempering. Fiz. met. i metalloved. 490-499 '57. (MIRA 10:11)

1. Kiyevskiy politekhnicheskiy institut.
(Steel--Metallography)
(Magnetic testing) (Tempering)

PERMYAKOV, V. G.: Doc Tech Sci (diss) -- "The processes of annealing in the iron-carbon and iron-nitrogen systems". Kiev, 1958. 29 pp (Min Higher Educ Ukr SSR, Kiev Order of Lenin Polytech Inst), 100 copies (KL, No 15, 1959, 115)

129-3-5/14

AUTHOR: Permyakov, V.G., Candidate of Technical Sciences

TITLE: Carbide Transformations in the Case of Low-temperature Decomposition of Super-cooled austenite (Karbidnyye prevrashcheniya pri nizkotemperaturnom raspade pereokhlazhdennogo austenita)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, No.3, pp. 24 - 29 (USSR)

ABSTRACT: Some authors claim that as a result of isothermal annealing at low temperatures, cementite carbide is observed in the decomposition products of the austenite, whilst other authors state that such annealing may result in the formation of carbides, the composition and the properties of which differ from that of cementite and are similar to carbide phases detected in investigating low-temperature tempering of hardened steels. In this paper, the carbide phases are investigated which form during low-temperature decomposition of super-cooled austenite in carbon and in some alloy steels. The investigations were carried out on five industrial grades of steel, with compositions as enumerated in Table 1, p.25. The results of the investigations confirmed the analogy of the carbide transformations during low-temperature decomposition of super-cooled austenite and tempering of hardened steels.

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PERIYH [illegible]

129-4-3/12

AUTHORS: Gridnev, V. N., Doctor of Technical Sciences, Professor, and Peryakov, V. G., Candidate of Technical Sciences, and Cherepin, V. T., Engineer.

TITLE: Magnetometric investigation of electric tempering of steel. (Magnitometricheskoye issledovaniye elektrootpuska stali).

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, No.4, 9-16 (USSR).

ABSTRACT: The aim of the work described in this paper was to investigate the processes taking place during high speed electric heating of hardened carbon steel and to study the phase composition produced as a result of electric tempering by heating to various temperatures. The investigations were effected on the carbon steels Y8A and Y12A (compositions respectively in %: 0.75 to 0.85 C, 0.25 to 0.35 Mn 0.30 Si max, 0.20 Cr max, 0.25 Ni max, 0.020 S max, 0.030 P max; 1.10 to 1.25 C, 0.15 to 0.25 Mn, 0.30 Si max, 0.20 Cr max, 0.25 Ni max 0.020 S max, 0.030 P max.) using specimens of 1.5 mm dia., 130 mm length which were hardened from 1050°C in water and for reducing the quantity of residual austenite they were slowly cooled to -183°C in liquid oxygen. Appropriate measures were

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Magnetometric investigation of electric tempering of steel.

taken to prevent oxidation and decarburisation during heating. During the tests the following were recorded simultaneously: temperature of the specimen, elongation, voltage drop across the specimen and the intensity of the current flowing through the specimen. In Fig.1 the oscillogram is reproduced which was obtained during heating of a hardened specimen of Y12A steel with a speed of 1200°C/sec. Results of magnetic investigations of repeated heating and cooling are reproduced in Fig.2, whilst the graphs, Fig.3, show curves of repeated heating and cooling, obtained after electric tempering, by heating to various temperatures and subsequent tempering at 220°C for 100 hours. Fig.4 shows the softening of steel with 0.2% C deformed in the cold state and heated electrically with a speed of 1700°C/sec. In Fig.4 curves are reproduced of repeated heating and cooling recorded after electric tempering of Y12A steel containing about 20% of residual austenite. Fig.6 shows thermal and dilatometric curves of heating of the steel Y12A with various contents of residual austenite. On the basis of the results, the authors arrive at the following conclusions:

Card 2/4 1. For heating speeds of hardened specimens of up to

Magnetometric investigation of electric tempering of steel.

10 000°C/sec the decomposition of the martensite and the carbide reactions proceed in accordance with relations observed during slow heating; the phase state of the decomposition products is determined solely by the conditions of the tempering process.
2. In the case of high speed heating, the decomposition of the residual austenite is suppressed; however, after heating of the steel to temperatures exceeding the beginning of the third transformation (i.e. above 400°C) the residual austenite decomposes into a ferrite-carbide mixture. Reduction of the stability of the residual austenite is caused apparently by the considerable volume effect of the third transformation.
3. During the third transformation the low temperature carbide becomes transformed into intermediate carbide. This process is accompanied by a change in the volume, in the magnetisation and in the heat capacity. Formation of cementite from the intermediate carbide in the case of continuous heating proceeds at higher temperatures and is also accompanied by a change in the magnetisation. Cementite can also form at lower temperatures, however, this requires a considerable time.

Card 3/4

PERMYAKOV, V.G., dots., kand.tekhn.nauk; BELOTSKIY, A.V., inzh.

X-ray temper examination in annealed, nitrided iron. Izv.vys.ucheb.zav.; chern.met. no.11:99-104 N '58. (MIRA 12:1)

1. Kiyevskiy politekhnicheskiy institut. Rekomendovano kafedroy metallovedeniya i termoobrabotki.
(Iron--Metallography) (Tempering) (Case hardening)

KAMENICHNYY, Iosif Solomonovich. Prinimal uchastiye: SKRYPNICHENKO, D.P., kand.tekhn.nauk. PERMYAKOV, V.G., kand.tekhn.nauk, retsenzent; SERDYUK, V.K., inzh., red.

[Practices in the heat treatment of tools] Praktika termicheskoi obrabotki instrumenta. Izd.2., ispr. i dop. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1959. 223 p. (MIRA 12:8)

(Tool steel--Heat treatment)

L 24765-66 EWT(1)/EWT(m)/EWA(d)/T/EWP(t) IJP(c) JD/WW

ACC NR: AP6015529 SOURCE CODE: UR/0370/65/000/001/0104/0107

AUTHOR: Belotskiy, A. V. (Kiev); Permyakov, V. G. (Kiev); Petrosyan, F. G. (Kiev); Pet'kov, V. V. (Kiev)

ORG: none

TITLE: Martensitic character of the intermediate transformation of austenite

SOURCE: AN SSSR. Izvestiya. Metally, no. 1, 1965, 104-107

TOPIC TAGS: austenite, x ray diffraction, austenite transformation, isothermal transformation, steel/40N5 steel, 37KhN3A steel

ABSTRACT: This paper is a continuation of the author's investigation of the mechanisms and kinetics of the decomposition of supercooled austenite using rapid high-temperature x-ray diffraction. Below are set forth new experimental data on the state of the initial and formed phases which confirm the martensitic character of the intermediate transformation of supercooled austenite.

Used in the investigation were steel 40N5 (synthetic steel based on Armco iron) containing 0.41% C and 5.09% Ni, and steel 37KhN3A (0.38% C, 3.09% Ni, 1.35% Cr, 0.19% Si, 0.31% Mn). Austenization of the specimens was done by heating at an average rate of about 200 deg/sec up to 1000—1050°C (for

Card 1/4 UDC: 669.017.3: 621.78

steel 40N5) and 1100°C (for steel 37KhN3A) which provided the complete dissolving of the carbide phase in the austenite. The supercooled specimens was x-rayed at different periods of the isothermal transformation.

The initial transformation period at 300 and 340°C is characterized by the practically unchanged lattice period of the gamma-phase. Then the line widths of the gamma- and alpha-phases are changed insignificantly. Apparently, in this period the effects of carbon-enrichment of the austenite and the carbon precipitation from austenite (carbide phase formation) overlap and the lattice period of the untransformed part of the austenite is unchanged. An increase in the holding time for all transformation temperatures investigated causes a sharp reduction in the lattice period of the austenite and a reduction of the line widths of the transformation product of the austenite-alpha-phase.

These experimental data clearly characterize the successive stages of the development of the intermediate transformation of austenite. Thus, for example, the increased line widths of the gamma-phase in relation to the isothermal holding time is associated with the increased concentration inhomogeneity caused by diffusive carbon redistribution. This decomposition stage is characterized by the intense carbide formation because of the depletion of carbon-enriched portions of the austenite, as a result of which the lattice period of the austenite is reduced very sharply.

Very interesting data were obtained in the analysis of the width of the interference lines (211) of the alpha-phase. The transformed alpha-phase is characterized by different values of line widths in the initial and final stages of the process which occurs under isothermal conditions. The line widths differe substantially also in the case where the alpha-phase formation occurs at another, either higher or lower, temperature.

The line width value for annealed alpha-phase of steel 40N5 was determined in the intermediate temperature region. It was equal to 1.9 mm. The regularities of the intermediate austenite transformation in steel 37KhN3A were studied at 300, 340, 380, 420 and 460°C. At 300, 340, and 380°C austenite decomposition generally proceeds according to those same regularities as in steel 40N5. With an increase in the isothermal holding temperature from 420 to 480°C, homogeneous austenite gradually becomes inhomogeneous. The data on the sharp increase of the lattice period of carbon-enriched austenite, to a known degree, aid in understanding and explaining the causes for the increased stability of supercooled austenite in the upper part of the intermediate region. The line width of the alpha-phase emerging during autenite decomposition in steel 37KhN3A considerably exceeds the line width of the alpha-phase of annealed steel. If the line width, measured on annealed specimens in the temperature range of the intermediate transformation amounted to 2.0 mm, then the line width of the alpha-phase, emerging under the isothermal decompostion of austenite at 300°C at the beginning of the holding was 4.1 mm and at the finish, i.e., after 30 minutes, was 3.3

L 24765-66
ACC NR: AP6015529

mm. At 420°C, the initial line width is equal to 3.2 mm, but after a one-hour hold is reduced to 2.7 mm.

Thus, the experimental data, obtained directly by rapid high-temperature x-ray diffraction at transformation temperatures, bear out the fact that the intermediate austenite transformation occurs according to a martensitic mechanism. Orig. art. has: 4 figures. [JPRS]

SUB CODE: 11, 20 / SUBM DATE: 16Dec63 / ORIG REF: 002

Card 4/4 VLP

L 36855-66 EWT(d)/EWT(m)/EWP(1)/EWT(t)/ETI IJP(c) GD/BB/JT

ACC NR: AP6023424 SOURCE CODE: UR/0139/66/000/003/0169/0173

AUTHOR: Belous, M. V.; Kochenkov, V. P.; Permyakov, V. G.

ORG: Kiev Politechnical Institute (Kiyevskiy politekhnicheskiy institut)

TITLE: Compact machine for producing thin-film elements

SOURCE: IVUZ. Fizika, no. 3, 1966, 169-173

TOPIC TAGS: microelectric thin film, semiconducting film, metal deposition, metal film, physics laboratory instrument

ABSTRACT: A relatively simple and compact machine for producing thin-film elements is described. This machine makes it possible to obtain thin metallic or semiconductor films by vaporization in a vacuum, to control the electric resistance of metallic films, to deposit protective coatings on thin films, and to effect the thermal processing of thin films in a vacuum. In the proposed machine (see Fig. 1), the cylindrical housing (height, 160 mm; inner diameter, 80 mm) is attached directly to an oil-vapor pump. The film-producing section is mounted on current-carrying supports passing through the cover of the cylinder. The clamps of the conical vaporizer, which is made of tungsten wire 0.5—0.8 mm in diameter, are attached to these supports. A metallic plate (72 x 30 x 3 mm) positioned horizontally above the vaporizer, has a rectangular depression containing a heater. A mica or glass substrate on which the thin film is deposited is pressed against this heater. The shape of the thin-film elements

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L 36855-66

ACC NR: AP6023424

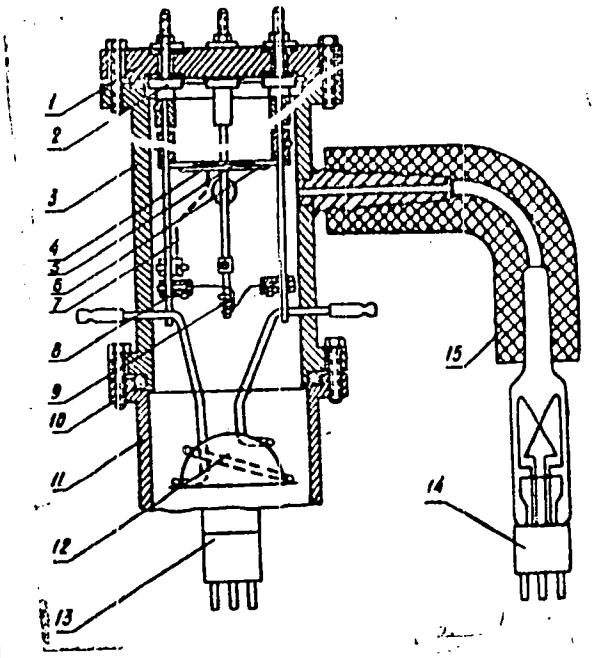

Fig. 1. Schematic drawing of the machine

1 - Cover; 2 - current carrier (support); 3 - housing; 4 - substrate heater; 5 - insulating spacer; 6 - substrate on which thin films are deposited; 7 - current carrier in the circuit for measuring the resistance of thin films; 8 - current carrier (holder) in the vaporizer circuit; 9 - tungsten vaporizer; 10 - rubber spacer; 11 - oil-vapor pump housing; 12 - cooled oil seal; 13 - VIM-2 pressure gage tube; 14 - LT-2 pressure gage tube; 15 - vacuum hose.

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L 36855-66
ACC NR: AP6023424

is determined by the shape of cutouts in a metallic mask. Five thin-film elements, 10 mm long and 3 mm wide, can be deposited simultaneously. Before deposition, the films, another mask is attached which leaves 3 x 3 mm squares exposed at each end of the elements. Silver contacts, about 1 mm thick, are deposited on the substrate. The upper mask is then removed and flexible copper contacts are pressed against the silver ones. The metal or alloy from which the thin films are to be made is placed in the tungsten vaporizer, and an ohmmeter is coupled to the clamped contacts. The conditions of deposition are determined by the current flowing through the vaporizer. The thin films acquire stable properties only after thermal processing in a vacuum (up to 10^{-5} mm Hg) at a temperature approaching the recrystallization temperature of the metal deposited. Orig. art. has: 4 figures. [JR]

SUB CODE: 11,09/ SUBM DATE: 10Jul64/ ORIG REF: 003/ ATD PRESS: 5040

Card 3/3

ACC NR: AR6035113 SOURCE CODE: UR/0147/66/000/008/I089/I089

AUTHOR: Belous, M. V.; Permyakov, V. G.; Popov, V. I.

TITLE: Unit for preparing thin layer of metal by vacuum evaporation with electrical resistance control during evaporation and heat treatment

SOURCE: Ref. zh. Metallurgiya, Abs. 8I619

REF SOURCE: Vestn. Kiyevsk. politekhn. in-ta. Ser. makhan.-tekhnol., no. 2, 1965, 114-121

TOPIC TAGS: metal layer, evaporation, vacuum evaporation, metal film

ABSTRACT: Description is given of a unit for obtaining thin coatings of metal by vacuum evaporation at $\sim 1 \cdot 10^{-5}$ mm of Hg and with a device for the analysis of their electrical properties consisting of a vacuum and mechanical systems, an electric circuit and a circuit for measuring electrical resistance by compensation. The mechanical system includes a casette for a backing, a heater, a disk with face guards (one for applying the film contacts measuring 5 x 5 mm and two for the film elements), and a contact device. Mica and glass plates measuring 55 x 35 mm and

Card 1/2 UDC: 669.017:66.048.5

ACC NR: AR6035113

~2 mm in thickness are used as the backing. It is also possible to apply a thin layer on the fragment of rock salt using a wire net as the backing. W or Mo conic type helices serve as the vaporizers. The distance between the vaporizer and the backing may be varied from 50 to 150 mm. The system described will permit application of film elements of variable width with controlled electrical resistance during production, using either a heated or cold nonconducting backing. V. Ferenets. [Translation of abstract] [AM]

SUB CODE: 13/

Card 2/2

L 40908-66 EWT(m)/T/EWP(t)/ETI IJP(c) JD

ACC NR: AP6030181 SOURCE CODE: UR/0148/66/000/005/0147/0151

AUTHOR: Belostkiy, A. V.; Mokhort, A. V.; Permyakov, V. G.

ORG: Kiev Polytechnical Institute (Kiyevskiy politekhnicheskiy institut)

TITLE: High-temperature roentgenography of Armco-iron nitriding

SOURCE: IVUZ. Chernaya metallurgiya, no. 5, 1966, 147-151

TOPIC TAGS: x ray analysis, austenite

ABSTRACT: Up to the present time only the end products of nitriding steel and iron after cooling of the specimens to room temperature have been studied. Now, the authors have developed a method to study the gaseous saturation of the metals on the basis of which is the direct roentgenographic analysis of nitrided specimens in the x-ray chamber. The special installation and high-temperature x-ray chamber used in the method are described. X-ray patterns of the initial stages of isothermal decomposition of recooled and nitrided Armco-iron (nitrided austenite) at 200°C are presented to illustrate the usefulness of the method. Orig. art. has: 4 figures. [JPRS: 36,728]

SUB CODE: 11, 20 / SUBM DATE: 28Sep64 / ORIG REF: 007

Card 1/1

UDC: 669.12:621.785.53

BELOUS, M.V.; MUL'TAKH, L.M.; PERMYAKOV, V.G.

Carbide transformations during the rapid deformation of 45 steel. Fiz.-met. i metalloved. 20 no.5:728-732 N '65. (MIRA 18:12)

1. Kiyevskiy politekhnicheskiy institut. Submitted November 10, 1964.

BELOUS, M.V.; PERMYAKOV, V.G.; SEVERYANINA, Ye.N.

Some problems in the methodology of the production and study of thin metallic films. Izv. vys. ucheb. zav.; fiz. 8 no.2:34-39 '65.
(MIRA 18:7)

1. Kiyevskiy politekhnicheskiy institut.

BELOUS, M.V.; PERMYAKOV, V.G.; TITARENKO, S.V.

Carbide transformation during the tempering of silicon steel. Izv. vys. ucheb. zav.; chern. met. 8 no.9:171-174 '65. (MIRA 18:9)

1. Kiyevskiy politekhnicheskiy institut.

L 61692-65 EWT(l)/EWT(m)/EWP(l)/T/EWP(t)/EES(b)-2/EWP(b)/EWA(c) Pl-4 IJP(c)
JD/GG

ACCESSION NR: AP5011383 UR/0139/65/000/002/0034/0039 32 B

AUTHORS: Belous, M. V.; Permyakov, V. G.; Severyanina, Ye. N.

TITLE: Some procedural problems in the production and investigation of thin metallic films 14

SOURCE: IVUZ. Fizika, no. 2, 1965, 34-39

TOPIC TAGS: thin film, metal film, film preparation, film measurement

ABSTRACT: The authors describe simple devices, constructed and used in the Metal Physics Laboratory of Kiev Polytechnic Institute, for the investigation of certain properties of thin films. The equipment used to obtain metallic films is similar to the UVR apparatus included with Soviet electron microscopes. The preparation of the films is described in detail. Electrical measurements were made through a system of contacts shown in Fig. 1 of the

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ACCESSION NR: AP5011383

Enclosure. A special potentiometer circuit for resistance measurements is shown in Fig. 2 of the Enclosure. Various experiments with thin films are described, and conditions for the preparation of nichrome films with specified parameters are presented. Original article has: 5 figures

ASSOCIATION: Kiyevskiy politekhnicheskiy institut (Kiev Polytechnic Institute)

SUBMITTED: 12Jul63 ENCL: 02 SUB CODE: MM, SS

NR REF SOV: 006 OTHER: 003

Card 2/4

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ACCESSION NR: AP5011383

ENCLOSURE: 01

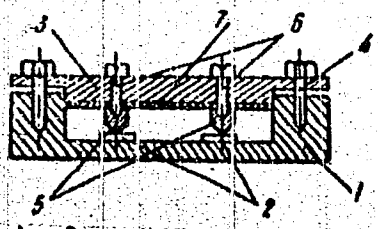

Fig. 1. Block of contacts for the setup used to measure film resistance.

1 - Block body, 2 - film contacts, 3 - block cover, 4 - bolt, 5 - contact, 6 - screw, 7 - mica liner

Card 3/4

L 61692-65
ACCESSION NR: AP5011383

ENCLOSURE: 02

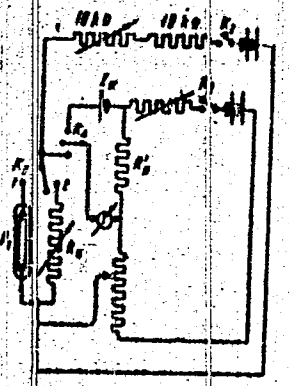

Fig. 2. Circuit diagram of apparatus for the measurement of film resistivity.

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L 6044 3-65 EWT(m)/EWP(i)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b)/EWA(c) IJP(c) JD

ACCESSION NR: AP5016524 UR/0126/65/019/006/0840/0844
539.23+621.316.825

AUTHOR: Belous, M. V.; Grankina, L. P.; Permyakov, V. G.; Proleyeva, Ya. N.

TITLE: Electric properties of thin coatings of nichrome. II. Thermal coefficient of resistivity

SOURCE: Fizika metallov i metallovedeniye, v. 19, no. 6, 1965, 840-844

TOPIC TAGS: electric resistivity, nimonic alloy, thin film, high temperature, high temperature metal, silver, metal physics

ABSTRACT: The temperature coefficients of resistivity ($\alpha_{200-500} \times 10^3$ deg^{-1}) of nichrome coatings (100 to 3000 Å) were studied in a temperature range of 300 to 900°K. For testing, the specimens were heated in a vacuum of $5 \cdot 10^{-5}$ mm Hg; some tests were also made on silver coatings for the same conditions. The character of the change of α with temperature remained the same for both cases: with rise in the temperature of heating in a vacuum α also increased. Corrections in Matthewson's rule for resistivity were made to take account of the dispersion of the conducting electrons by the surface of the coating. The final equation evolved was:

$$\rho = \rho_T + \rho_i + \rho_s.$$

Card 1/2

L 604 3-65

ACCESSION NR: AP5016524

where ρ is total resistivity, ρ_t is thermal resistivity, ρ_i is resistivity due to impurities, and ρ_δ is resistivity due to surface effects. The temperature coefficient of resistivity was defined as $\alpha = \frac{\partial \rho}{\partial T} \cdot \frac{1}{\rho}$. Values of α were found to be lower for thin layers, when compared to those of more massive samples, for the same defect density in the crystal structure and for the same ρ_T. Upon cooling, the ρ-T°K curve was lowered considerably, but steadily rose to the same value for heating at high temperatures. Theoretical arguments were given based on adsorption of atoms due to increased surface diffusion and surface tension. In conclusion, the practical uses of nichrome coatings in bolometers were enumerated. Orig. art. has: 3 figures.

ASSOCIATION: Kiyevskiy ordena Lenina politekhnicheskiy institut (Kiev "Order of Lenin" Polytechnic Institute)

SUBMITTED: 08May64 ENCL: 00 SUB CODE: MM, EM

NO REF SOV: 009 OTHER: 003

Card 1/2

BE[illegible]OV, A.V. (Kiyev); PERKYAKOV, V.I. (Kiyev); PERESYAN, P.G. (Kiyev); PETKOV, V.V. (Kiyev)

Martensite crystals in the intermediate transformation of austenite. Izv. AN SSSR. Met. i [illegible] Ja-F '65. (MIRA 18:-

ACCESSION NR: AP4020247 S/0129/64/000/003/0042/0044

AUTHOR: Permyakov, V. G.; Kaz'miruk, A. I.

TITLE: Formation and phase composition of a diffusion layer during the high-temperature nitriding of 38KhMYuA-steel

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 3, 1964, 42-44

TOPIC TAGS: diffusion layer, nitriding, ferrite carbide structure, phase transformation, austenite formation, supercooling

ABSTRACT: The authors investigated the mechanism of the formation of a diffusion layer during the high-temperature nitriding of ferrite-carbide structures. The composition of the 38KhMYuA-steel specimens was the following: 0.40% C; 0.34% Si; 0.48% Mn; 1.53% Cr; 0.86% Al; 0.20% Mo; 0.025% S and 0.022% P. Nitriding was preceded by the usual heat treatment, cold drawing and recrystallization annealing under vacuum. Nitriding temperatures were 750 C and a vertical tubular furnace was used. The increase of the diffusion layers during this process was accompanied by phase transformation and occurred as a result of the formation of nuclei and the growth of crystals of the new phase. The character of its

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ACCESSION NR: AP4020247

connection with the initial structure is affected by the rate of crystallization and the supply of nitrogen to the crystallization front. Furthermore, carbon and alloying elements are redistributed during nitriding as evidenced by the formation of austenite with a different tendency towards supercooling during hardening. Orig. art. has 2 figures.

ASSOCIATION: Kievskiy politekhnicheskiy institut (Kiev Polytechnic Institute)

SUBMITTED: 00 DATE ACQ: 31Mar64 ENCL: 00

SUB CODE: ML NO. REF. SOV: 004 OTHER: 000

Card 2/2

PERMYAKOV, V.G.; KAZ'MIRUK, A.I.

Formation and the phase constitution of a diffusion layer during high-temperature nitriding of 30KhMIUA steel. Metalloved. i term. obr. met. no.3:42-44 Mr '64. (MIRA 17:4)

1. Kiyevskiy politekhnicheskiy institut.

L 18047-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD

ACCESSION NR: AP3002845 S/0126/63/015/006/0867/0872

AUTHORS: Permyakov, V. G.; Kaz'muruk, A. I. 43

TITLE: Phase composition and growth of a diffusion layer in the process of high-temperature nitriding

SOURCE: Fizika metallov i metallovedeniye, v. 15, no. 6, 1963, 867-872

TOPIC TAGS: Armco iron, steel 45, nitriding, steel 38KhMYuA, diffusion layer, growth, phase composition, microhardness, microstructure

ABSTRACT: The samples of Armco iron and steels 45 and 38KhMYuA were nitrided at 600-800C and oil hardened. Their microstructure, microhardness, and phasal compositions were studied. The Armco iron contained 0.02% carbon and was practically devoid of alloying elements; the steels contained 0.48 and 0.40% of carbon and various amounts of Si, Mn, Cr, S, and P. The results showed that the Armco iron had a sharp boundary between the nitrous austenite case and the nitrous ferrite core. The hardened layer grew inward along its whole frontal surface, its progress regulated by the growth velocity of the grains in one direction. Steel 45 showed the formation and growth of new disseminated austenite grains in the zone of hardness gradation. This was explained by the presence of alloying elements that brought

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L 18047-63

ACCESSION NR: AP3002845

about the formation of nitrides and by the assimilation of surplus nitrogen by the disseminated grains. Experiments with steel 38KhMYuA (also containing the alloying elements) showed that the growth mechanism of the case (at a certain stage) followed the same pattern as that of carbon steels (after the hardened layer reached a certain thickness, its further growth was regulated by nitrogen diffusion). Orig. art. has: 1 table and 4 figures.

ASSOCIATION: Kiyevskiy politekhnicheskiy institut (Kiev Polytechnic Institute)

SUBMITTED: 05Jul62 DATE ACQ: 23Jul63 ENCL: 00

SUB CODE: ML NO REF SOV: 009 OTHER: 001

Card 2/2

VANIN, V.S.; PERMYAKOV, V.G.

Accelerating the high-temperature case hardening of steel. Izv. AN SSSR. Otd.tekh.nauk. Met. i topl. no.5:92-95 S-O '62. (MIRA 15:10)
(Case hardening)

S/126/63/015/003/002/025
E021/E135

AUTHORS: Permyakov, V.G., Belotskiy, A.V., and Petrosyan, F.G.

TITLE: High-temperature X-ray diffraction study of the intermediate transformation of austenite in carbon steels

PERIODICAL: Fizika metallov i metallovedeniye, v.15, no.3, 1963, 334-338

TEXT: The X-ray investigations of the intermediate transformation of austenite which have been reported in the literature were carried out on steels with alloying elements stabilizing austenite. The technique used in the present investigation gives rapid supercooling of austenite in the X-ray camera and allows the isothermal transformation to be studied directly at the transformation temperatures. Because of this, carbon and low-alloy steels can be used. The present work shows that in the type У7А (U7A) and У12А (U12A) steels studied, enrichment of austenite with carbon proceeds at all temperatures in the intermediate range because of diffusion, the extent and rate of enrichment increasing with decreasing carbon content in

the initial austenite. The lattice spacing in type U7A steel at high intermediate-transformation temperatures increases more than in type U12A. The observed small increase in the spacing for steel U12A at comparatively high intermediate-transformation temperatures is apparently due to the more intensive precipitation of carbide phase through the increase in carbon content and acceleration of its diffusional redistributions. During transformation concentration inhomogeneity increases; this effect is also being observed in the incubation period.
There are 6 figures and 1 table.

ASSOCIATION: Kiyevskiy politekhnicheskiy institut
(Kiev Polytechnical Institute)

SUBMITTED: June 5, 1962

BRAUN, Mikhail Petrovich, doktor tekhn. nauk, prof.; PERMYAKOV, V.G., doktor tekhn.nauk, retsenzent; NOVIK, A.M., red.izd-va; MATUSEVICH, S.M., tekhn. red.

[Effect of addition elements on the properties of steel] Vliianie legiruiushchikh elementov na svoistva stali. Kiev, Gostekhizdat URSR, 1962. 190 p. (MIRA 16:3)
(Steel alloys—Metallurgy)

PERMYAKOV, V.G.; KAZ'MIRUK, A.I.

Changes in structure and properties during the nitriding and heat treatment of 35KhMIUA steel. Izv.vys.ucheb.zav.; chern.met. 5 no.4:118-123 '62. (MIRA 15:4)

1. Kiyevskiy politekhnicheskiy institut.
(Steel alloys—Metallography) (Case hardening)

S/180/62/000/005/003/011
E111/E435

AUTHORS: Vanin, V.S., Permyakov, V.G. (Nikolayev, Kiyev)

TITLE: Acceleration of high-temperature carburization of steel

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i toplivo, no.5, 1962, 92-95

TEXT: The authors report experiments in which diffusion of carbon into type СТ.20 (St.20) steel from a higher-carbon steel or from a propane-butane-air mixture were carried out. Heating was effected by a glow discharge. With correct choice and careful maintenance of experimental conditions a high carburization rate could be obtained without deleterious fusion of the surface. Most experiments were carried out at 1150°C with holding times of 10 minutes, some at 1100 and 1200°C. The depth (d, in mm) of the carburized layer was found to be equal to

$$d = \sqrt{\tau} \cdot 10^{\frac{T-3400}{T}} \qquad (1)$$

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where τ - cementation time (seconds); T - absolute temperature of the process, °K. The activation energy of the process was 32200 cal/g atom. With improved process atmosphere and temperature control, even higher speeds should be possible and this should enable combining the process with heating for hardening. With components of a certain size it should be possible to complete surface carburization before the core is completely heated. There are 5 figures.

SUBMITTED: February 9, 1962

S/148/62/000/004/001/006
E111/E435

AUTHORS: Permyakov, V.G., Kaz'miruk, A.I.

TITLE: Change in the structure and properties of nitrided and heat treated 35Х[illegible]А (35KhMYuA) steel

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, no.4, 1962, 118-123

TEXT: Nitriding followed by heat treatment of the steel 35KhMYuA was investigated. Specimens were nitrided in a stream of dissociated ammonia at 600 to 900°C (50°C intervals) for 2 to 11 hours and oil quenched. Tempering was carried out at 100 to 550°C for 1 hour, specimens being sealed in quartz ampules. The specimens were subjected to microstructure, microhardness, magnetic and X-ray structural investigation. At over 650°C nitriding gave a 0.5 to 0.7 mm thick layer in 8 to 11 hours; subsequent hardening led to formation of a very hard layer of nitrogen-carbon martensite and residual austenite. Tempering produced in the hardened layer a mixture of ferrite and dispersed carbonitride phases; the resulting hardness with tempering at

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250 and 400 - 450°C was greater than that of the layer in the hardened state. Nitriding at 650 to 750°C for 8 to 11 hours followed by hardening and tempering gave practically the same nitrided-layer thickness and the same ferrite-carbide mixture structure and high surface hardness as produced by the present-day nitriding treatment for this steel (60 to 70 hours at 520 to 540°C). For parts of simple shape the currently used long treatment can be replaced by short nitriding at 650 to 750°C, followed by tempering at 400 to 450 or 250°C. There are 5 figures.

ASSOCIATION: Kiyevskiy politekhnicheskiy institut
(Kiyev Polytechnical Institute)

SUBMITTED: November 9, 1960

PERLYAKOV, Vyacheslav Georgiyevich, for Doc of Technical Sci on the basis of dissertation defended 27 Apr 59 in Council of the Kiev Order of Lenin Polytechnical Institute, entitled: "Processes of Release in the System Iron-Carbon and Iron-Nitrogen." (BVisSO USSR, 2-61, 30)

PERMYAKOV, V.G.; TODOROV, R.P.; KOSHOVNIK, G.I.; BELOTSKOY, A.V.

Effect of homogenizing on the redistribution of silicon and the mechanical properties of magnesium cast iron with a gray fracture. Izv. vys. uchob. zav.; chern. met. no.10:143-147 '60. (MIRA 13:11)

1. Kiyevskiy politekhnicheskiy institut.
(Cast iron--Metallography) (Annealing of metals)

S/148/60/000/012/011/020
A161/A133

18.7500 1454, 1555, 1413

AUTHORS: Permyakov, V. G., and Belous, M. V.

TITLE: On the nature of the "third transformation" volume effect in the tempering of hardened steel

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no. 12, 1960, 99 - 105

TEXT: The phenomenon of volume decrease in the "first transformation" with martensite decomposition, and of the volume increase in the "second transformation" with decomposition into an alpha-phase and a phase rich in carbon has been sufficiently elucidated (Ref. 1: E. Z. Kaminskiy, D. Katsnel'son. Zhurnal tekhnicheskoy fiziki, 15, no. 3, 1945; Ref. 2: V. N. Gridnev, A. S. Rapoport, Metallurg, 1940, no. 11; Ref. 3: B. L. Averbach, M. Cohen. Trans. of A.S.M., v. 46, 1950, 851; Ref. 4: W. Ellinghaus. Archiv fuer das Eisenhuettenwesen, 1956, no. 6 - 7), but the opinions on the "third transformation" are controversial. The subject experiments were an attempt to find a relation between the volume effects of transformation in the tempering process and the chemical composition, specific volume, and the struc-

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On the nature of the "third transformation"...

ture of the elementary carbide lattice cell during low-temperature tempering. The three commercial steel grades investigated were

	(%) C	Si	Mn	Ni	S	P	Cu
У8А (U8A)	0.79	0.20	0.30	0.11	0.02	0.017	0.19
У10А (U10A)	1.09	0.20	0.22	0.13	0.00	0.013	0.15
У12А (U12A)	1.15	0.22	0.25	0.11	0.02	0.011	0.18

Cylindrical specimens 4, 3 and 2.5 mm in diameter and 70 mm in length were hardened at temperatures ensuring complete austenite homogeneity and cold-treated in solid carbon oxide and liquid oxygen to reduce residual austenite. Its quantity was determined with a ballistic magnetometer. The hardened specimens were heated in a dilatometer furnace (Ref. 1: Permyakov, Belous. "Zavodskaya laboratoriya, 1956, no. 10) to 600°C and cooled to room temperature in the furnace at a cooling rate of 3 - 4°/min. Separate specimens were preliminarily tempered after hardening. The cold-deformed specimens were tested in the same way. The dilatograms were utterly different (Fig. 1 and 2). The obtained data are discussed with reference to the results obtained by other authors, including foreign ones (Ref. 5: A. P. Gulyayev, N. I. Burova. Metallovedeniye i obrabotka metallov, 1955, no. 1; Ref. 7:

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On the nature of the "third transformation"...

V. G. Permyakov. Zhurnal tekhnicheskoy fiziki, v. 25, no. 5, 1955; Ref. 12: S. F. Yur'yev. Zhurnal tekhnicheskoy fiziki, v. 20, no. 5, 1950), and the authors of the present article come to the conclusion that the contraction in the "third transformation" is caused not by the recrystallization processes but by the transfer of low-temperature tempering carbide into intermediate carbide and further into cementite, and possibly this transfer is accompanied by continued C liberation from the solid alpha lattice (and hence additional lattice contraction), and maybe also by a very slight volume effect of the phase hardening relief. The specific volume of low-temperature grade carbide (0.138 cm^3/g) determined in the tests differs only a little (2 - 3%) from other data obtained by X-ray and electronographic analysis (Ref. 9: G. Krayner. Problemy sovremennoy metallurgii, 1952, no. 3; Ref. 15: Ye. L. Gal'perin, Yu. S. Terminasov. Kristallografiya, v. 2, 1957, no.5; Refs. 8 and 14 see English-language publications). There are 5 figures and 15 references: 11 Soviet-bloc and 4 non-Soviet-bloc. The three references to English-language publications read as follows: B. L. Averbach and M. Cohen. Trans. of A.S.M., v. 46, 1950, 851; K. H. Jack. Journ. of the Iron and Steel Inst., 169, P. II, 1951; F. S. C. Boswell. Acta cristallogr., 1958, no. 1, 11.

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23622
S/143/60/000/011/020
A161/A133

On the nature of the "third transformation"...

ASSOCIATION: Kiyevskiy politekhnicheskiy institut (Kiyev Polytechnic Institute)

SUBMITTED: October 14, 1959

Fig. 1. Hardened U12A

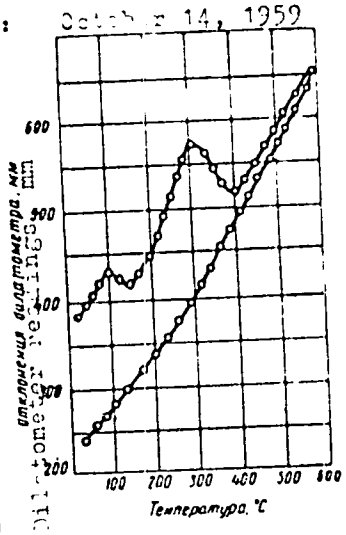
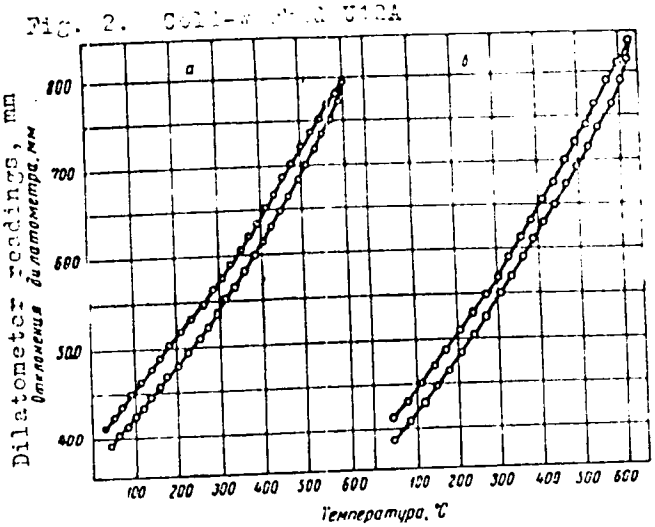


Fig. 2. Oxidized and U12A



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PHASE I BOOK EXPLOITATION SOV/[illegible]

[illegible] mashinostroitel'nykh [illegible], Kiyevskoye oblastnoye pravleniye.

Metallovedeniye i termicheskaya obrabotka (Physical Metallurgy and Heat Treatment of Metals) Moscow, Mashgiz, [illegible] 356 p. Errata slip inserted. 5,000 copies printed.

Sponsoring Agency: Gosudarstvennyy nauchno-tekhnicheskiy komitet Soveta Ministrov UkrSSR. [illegible] nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti. Kiyevskoye oblastnoye pravleniye.

Editorial Board: M. P. [illegible], Doctor of Technical Sciences, I. Ya. Dekhtyar, Doctor of Technical Sciences, D. A. Draygor, Doctor of Technical Sciences, I. S. Kamenichnyy, Engineer, Ye. A. Markovskiy, Candidate of Technical Sciences, V. G. Permyakov, Doctor of Technical Sciences, and A. V. Chernovol, Candidate of Technical Sciences, Ed.: M. S. Soroka, Tech. Ed.: M. S. Gornostaypol'skaya; Chief Ed., Mashgiz (Southern Dept.): V. K. Serdyuk, Engineer.

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PURPOSE: This collection of articles is intended for scientific workers and technical personnel of research institutes, plants, and schools of higher technical education.

COVERAGE: The collection contains papers presented at a convention held in Kiyev on problems of physical metallurgy and methods of the heat treatment of metals applied in the machine industry. Phase transformations in metals and alloys are discussed, and results of investigations conducted to ascertain the effect of heat treatment on the quality of metal are analyzed. The possibility of obtaining metals with given mechanical properties is discussed, as are problems of steel brittleness. The collection includes papers dealing with kinetics of transformation, heat treatment, and properties of cast iron. No personalities are mentioned. Articles are accompanied by references, mostly Soviet.

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Card [illegible]

S/148/60/000/010/015/018
A161/A030

AUTHORS: Permyakov, V.G.; Todorov, N.P.; Kosnevnik, G.I.; Belotskiy, A.V.

TITLE: The Effect of Homogenizing on the Redistribution of Silicon and the Mechanical Properties of Magnesium Cast Iron With Grey Fracture

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, 1960, No. 10, pp. 143 - 147

TEXT: Cast iron with 3.51% C; 3.36% Si; 0.39% Mn; 0.10% P, 0.008% S; and 0.053% Mg has been studied before and after homogenizing in 1,050°C. Uneven Si distribution was revealed in the state before homogenizing, with the highest concentration at graphite inclusions (Fig. 1), along with reduced C content in these spots and the lowest quantity of residual austenite at the graphite globules, due to the mutual displacing effect of C and Si. Holding in 1,050° homogenized the structure. The effect was studied with an x-ray camera in cobalt anode radiation using the inverse method. The α-phase line (310) was phocused at 60 mm distance between the specimen and the film, and armco iron with a total impurities content maximum 0.05% was used as the reference piece; the x-ray camera was a "1 KROS" (1 KROS). The variation of photometric curves (Fig. 3) indicated high

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V

The Effect of Homogenizing on the Redistribution of Silicon and the Mechanical Properties of Magnesium Cast Iron With Grey Fracture

heterogeneity of α-phase before homogenizing. The microhardness of ferrite was measured with a ПМТ-3 (PMT-3) apparatus. The results (Fig. 4) show that the difference in the hardness values gradually disappeared. Ferrite was practically fully homogenized after 17 hours holding at 1,050°. Dilatometric determinations (Fig. 5) proved that the second phase of graphitization reduced rapidly at the beginning and smoothly evened out as time went on. The decomposition of eutectic carbides stabilized after 6 - 7 h. The change in mechanical properties was studied on iron specimens of a slightly different composition. The results are illustrated by curves (Fig. 6) and show a slight drop of strength and hardness but an improved plasticity. It is apparent that brittleness before homogenizing is caused by Si concentration in spots, and that the improved plastic properties of iron are due to redistribution of Si. It is obvious that homogenizing must preceed the second graphitization stage in cases when a high plasticity of castings is wanted. There are 6 figures.

ASSOCIATION: Kiyevskiy politekhnicheskiy institut (Kiyev Polytechnical Institute)

SUBMITTED: January 7, 1960

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S/148/60/000/010/015/018
A161/A030

The Effect of Homogenizing on the Redistribution of Silicon and the Mechanical Properties of Magnesium Cast Iron With Grey Fracture

Figure 1: Iron with 3.65% C; 3.22% Si; 0.42% Mn; 0.031% P; 0.009% S; and 0.045% Mg. Etched with 2-% nitric acid solution in spirit: a - close at graphite inclusions. X 1,350. b - far from graphite inclusions. X 800.

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S/148/60/000/010/015/018
A161/A030

The Effect of Homogenizing on the Redistribution of Silicon and the Mechanical Properties of Magnesium Cast Iron With Grey Fracture

Figure 2: Iron quenched from 1,100°C (etched with the same solution). a - far from, and b - close to graphite inclusions.

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The Effect of Homogenizing on the Redistribution of Silicon and the Mechanical Properties of Magnesium Cast Iron With Grey Fracture

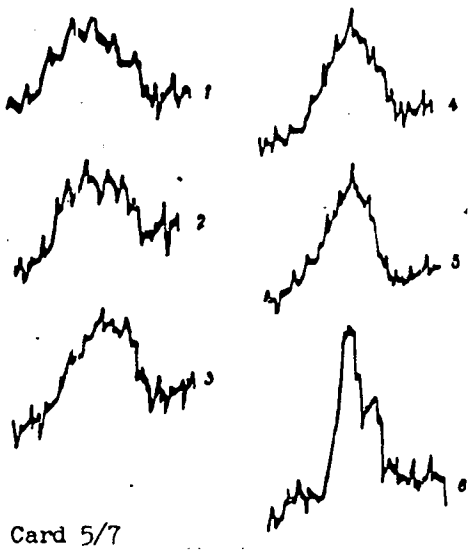

Figure 3: Photometric curves of ferrite.

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S/148/60/000/010/015/018
A161/A030

The Effect of Homogenizing on the Redistribution of Silicon and the Mechanical Properties of Magnesium Cast Iron With Grey Fracture

Figure 4: Change of the microhardness of ferrite dependent on soaking in 1,050°C.

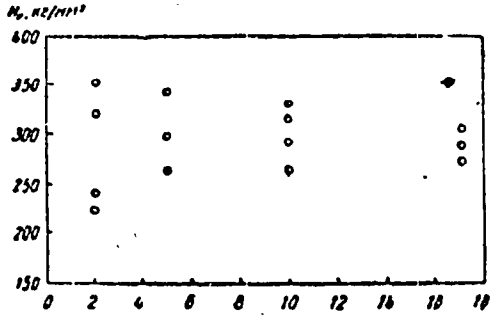
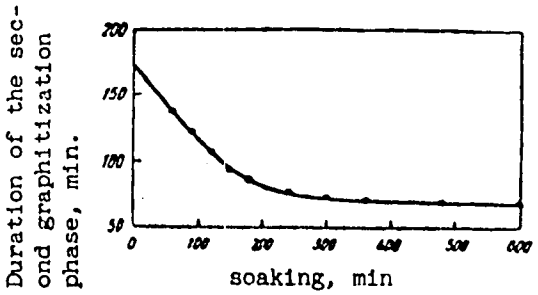


Figure 5: Dependence of the second graphitization phase on time in 1,050°C (0 to 600 min).



Card 6/7

S/148/60/000/010/015/018
A161/A030

The Effect of Homogenizing on the Redistribution of Silicon and the Mechanical Properties of Magnesium Cast Iron With Grey Fracture

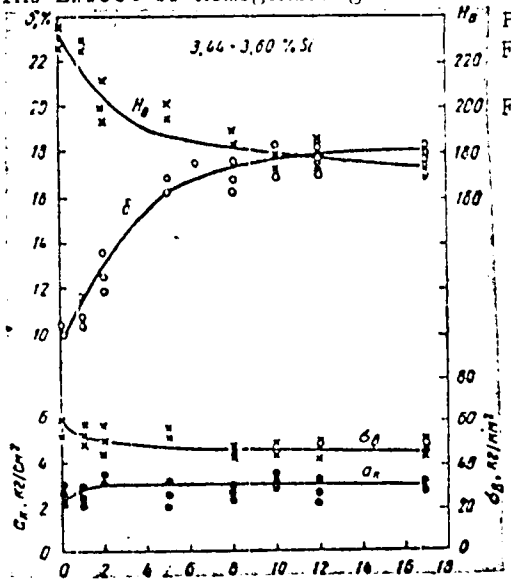


Figure 6

Card 7/7

BRAUN, M.P., doktor tekhn. nauk, prof., red. (Kiev); DEKHTYAR, I.Ya., doktor tekhn. nauk, red.; DRAYGOR, D.A., doktor tekhn. nauk, red.; KAMENICHNYY, I.S., inzh., red.; MARKOVSKIY, Ye.[illegible], kand. tekhn. nauk, red.; PERMYAKOV, V.G., inzh., doktor tekhn. nauk, red. (Kiev); CHERNOVOL, A.V., kand. tekhn. nauk, red. (Kiev); SOROKA, M.S., red.; GORNOSTAYPOL'SKAYA, M.S., tekhn. red.

[Metals and their heat treatment] Metallovedenie i termicheskaia obrabotka. Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1961. 336 p. (MIRA 14:5)

1. Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti. Kiyevskoye oblastnoye pravleniye.
(Metallography) (Metals--Heat treatment)

S/032/61/027/002/025/026
B124/B201

AUTHORS: Permyakov, V. G. and Belous, M. V.

TITLE: Exchange of experience

PERIODICAL: Zavodskaya laboratoriya, v. 27, no. 2, 1961, 235

TEXT: For the purpose of studying phase transitions at increased rates of heating the authors suggest to use a dilatometric accessory (see Fig.) to the universal nine-loop oscilloscope. The quartz and metal rollers are supported by specimen (1) in quartz tube (2), as well as on brass plate (3) with the reflector (4). The brass plate is mounted on steel axis (5). The support of the agate bearings (6) is fastened to brass plate (7), which has a window for the passage of the roller. A clamping spring is fastened to it. Brass plate (7) is screwed to the frame of the measuring loop by means of screws (8) and (9). The quartz tube is placed in a metal bushing (10). Its flange is fastened to the brass plate by means of two bolts, which, in turn, is fastened to the frame of the loop by two studs. During operation the dilatometer is introduced into the socket of the loop, and an output inductor is mounted on the quartz tube. [Abstracter's note:

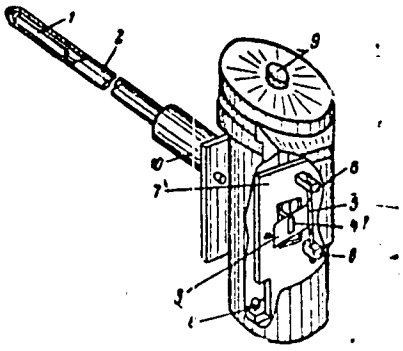
Card 1/2

S/032/61/027/002/025/026
B124/B201

Exchange of...

This is almost a full translation]. There is 1 figure.

ASSOCIATION: Kiyevskiy politekhnicheskiy institut (Kiyev Polytechnic Institute)



Card 2/2

PERMYAKOV, V.G.; BELOUS, M.V.

Magnetic method of quantitave carbide analysis of carbon steels.
Fiz. met. i metalloved. 10 no.2:317-320 Ag '60. (MIRA 13:9)

1. Kiyevskiy politekhnicheskiy institut.
(Phase rule and equlibrium) (Magnetic testing)

PERMYAKOV, V.G.; BELOUS, M.V.

Changes in the carbide phase during the tempering of hardened steel. Izv.vys.ucheb.zav.; chern.met. no.6:119-123 '60. (MIRA 13:7)

1. Kiyevskiy politekhnicheskiy institut.
(Steel--Heat treatment)
(Phase rule and equilibrium)

S/148/60/000/006/007/010

AUTHORS: Permyakov, V. G., Belous, M. V.

TITLE: Changes in the Carbide Phase During Tempering of Quench-Hardened Steel

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, 1960, No. 6, pp. 119-123

TEXT: There are contradictory opinions on the composition and the properties of the carbide phase of low-temperature tempering and on the nature of processes causing abnormal changes in the steel properties within a temperature range of 300 - 400°C, so-called "third transformation". Contrary to some other authors it is assumed that low-tempering carbide is different from Fe_3C cementite by its composition, properties and the type of the crystal lattice. The composition of low-temperature carbide and its specific volume are determined for У8А (U8A), У10А (U10A) and У12А (U12A) steel. Magnetic effects of tempering were studied by the differential magnetic method. Changes in the specific volume during tempering were determined using a high-sensitive dilatometer. Specimens were water-quenched and supercooled in liquid oxygen. The quench-hardened specimens were subjected to high-speed heating in the

Card 1/2

S/148/60/000/006/007/010

Changes in the Carbide Phase During Tempering of Quench-Hardened Steel

magnetometer bath; their magnetic properties were photorecorded during heating and isothermal holding. A formula is given to calculate the index x in the formula for low-temperature carbide Fe_xC and the value of x was calculated to equal 2. Besides the quantitative analysis of magnetic curves, an analysis of tempering dilatograms was made. The composition of the carbide is expressed therefore by the formula Fe_2C; its density is 7.15 g/cm^2. There are 2 graphs and 5 references: 4 Soviet and 1 English.

ASSOCIATION: Kiyevskiy politekhnicheskiy institut (Kiyev Polytechnic Institute)

SUBMITTED: November 17, 1959

/B

Card 2/2

CHERTOK, B.Ye.; PERTYAKOV, V.I.; [illegible], A.S., inzh., retsenzent; BARABAN, Ya.[illegible], inzh., retsenzent; GRINSHTEYN, L.S., inzh., retsenzent; [illegible], L.F., inzh., red.; FEDOROV, N.N., inzh., red.

[Technology of metals and structural materials] Tekhnologiia metallov i konstruktsionnye materialy. Moskva, Mashinostroenie, 1965. [illegible] (MIRA 18:1)

ACC NR: AP6033842 SOURCE CODE: UR/0182/66/000/010/0023/0025

AUTHOR: Permyakov, V. I.

ORG: none

TITLE: Explosive forming of end closures

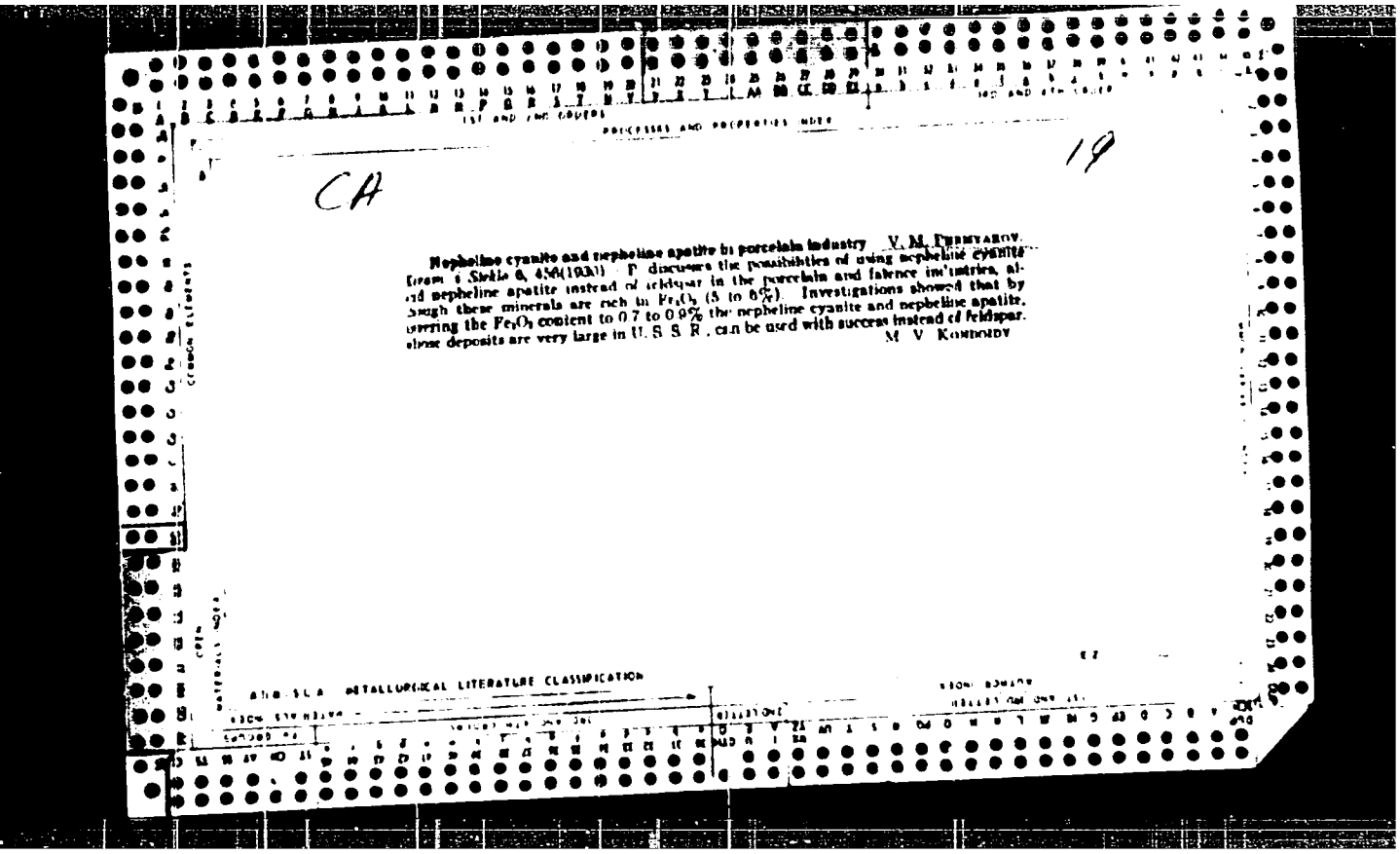
SOURCE: Kuznechno-shtampovochnoye proizvodstvo, no. 10, 1966, 23-25

TOPIC TAGS: explosive forming, end closure, steel manufacturing process

ABSTRACT: The process of explosive forming of steel end closures up to 1200 mm in diameter is described and recommendations for the determination of some important conditions, such as the weight of explosive charge, the distance from the charge to the blank surface, the water column above the explosive charge, and the blank clamping force, are made. End closures 1200 mm in diameter were formed in three steps, first with a 1300 g charge placed 300 mm above the blank, second with a 500 g charge 500 mm above the blank, and third a 1000 g charge 500 mm above the blank. Distances for the first, second, and third passes were calculated by the equation $R = (0.3—0.6)D$, where D is blank diameter; the height of the water column was calculated by the equation $H = (20—25)r_0$, where r_0 is the radius of the charge in mm. A metal-lined pool 5 m in diameter and 4.5 m deep was used in the forming. Orig. art. has: 6 figures.

SUB CODE: 13/ SUBM DATE: none/ ORIG REF: 002/

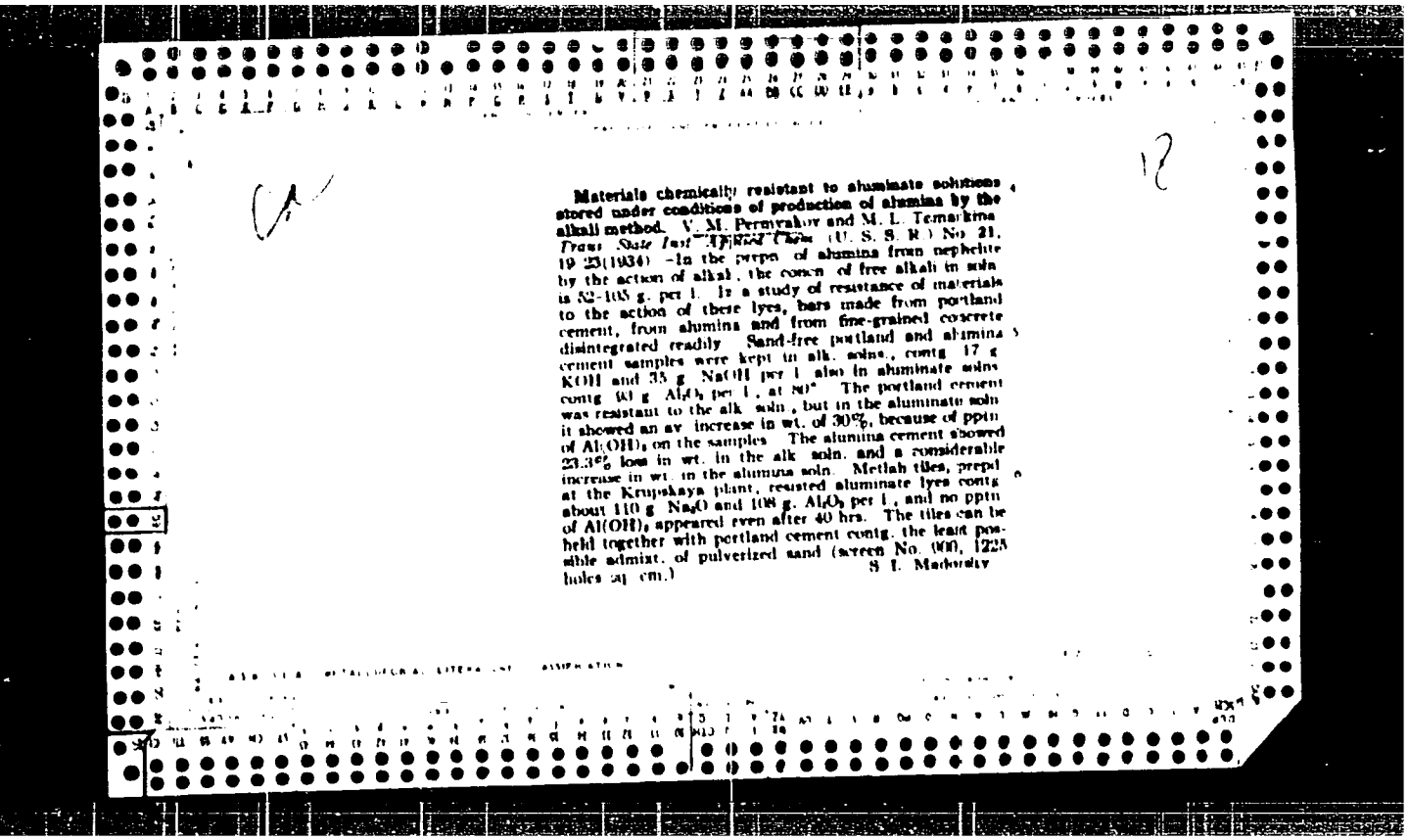
Card 1/1 UDC: 621.983.044



CA

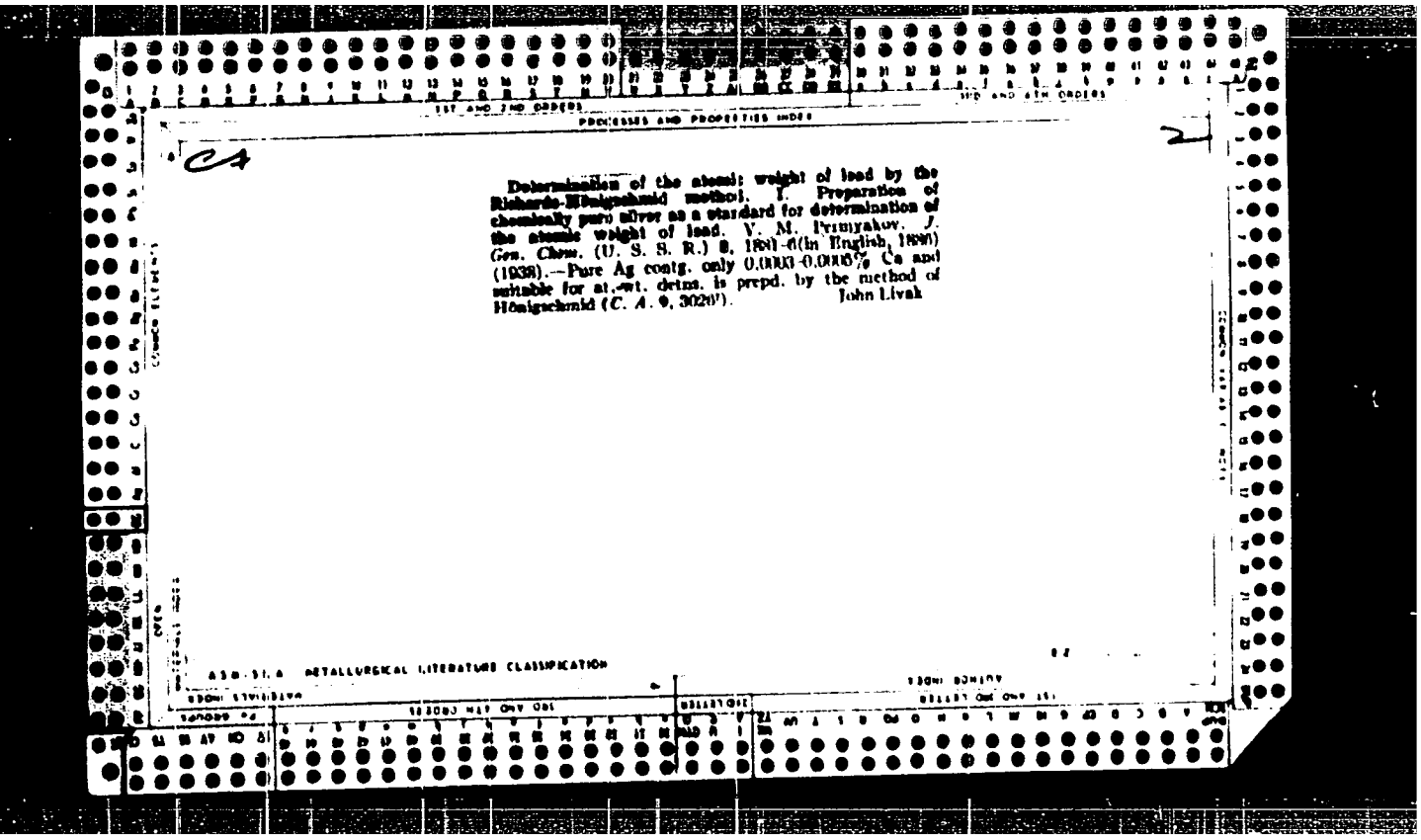
19

Nepheline cyanite and nepheline apatite in porcelain industry V. M. Pyrnyakov. From *Steklo & Keramika* 8, 4-5(1951). P discusses the possibilities of using nepheline cyanite and nepheline apatite instead of feldspar in the porcelain and faience industries, although these minerals are rich in Fe_2O_3 (5 to 6%). Investigations showed that by lowering the Fe_2O_3 content to 0.7 to 0.9% the nepheline cyanite and nepheline apatite, whose deposits are very large in U. S. S. R., can be used with success instead of feldspar.
M. V. Kononov

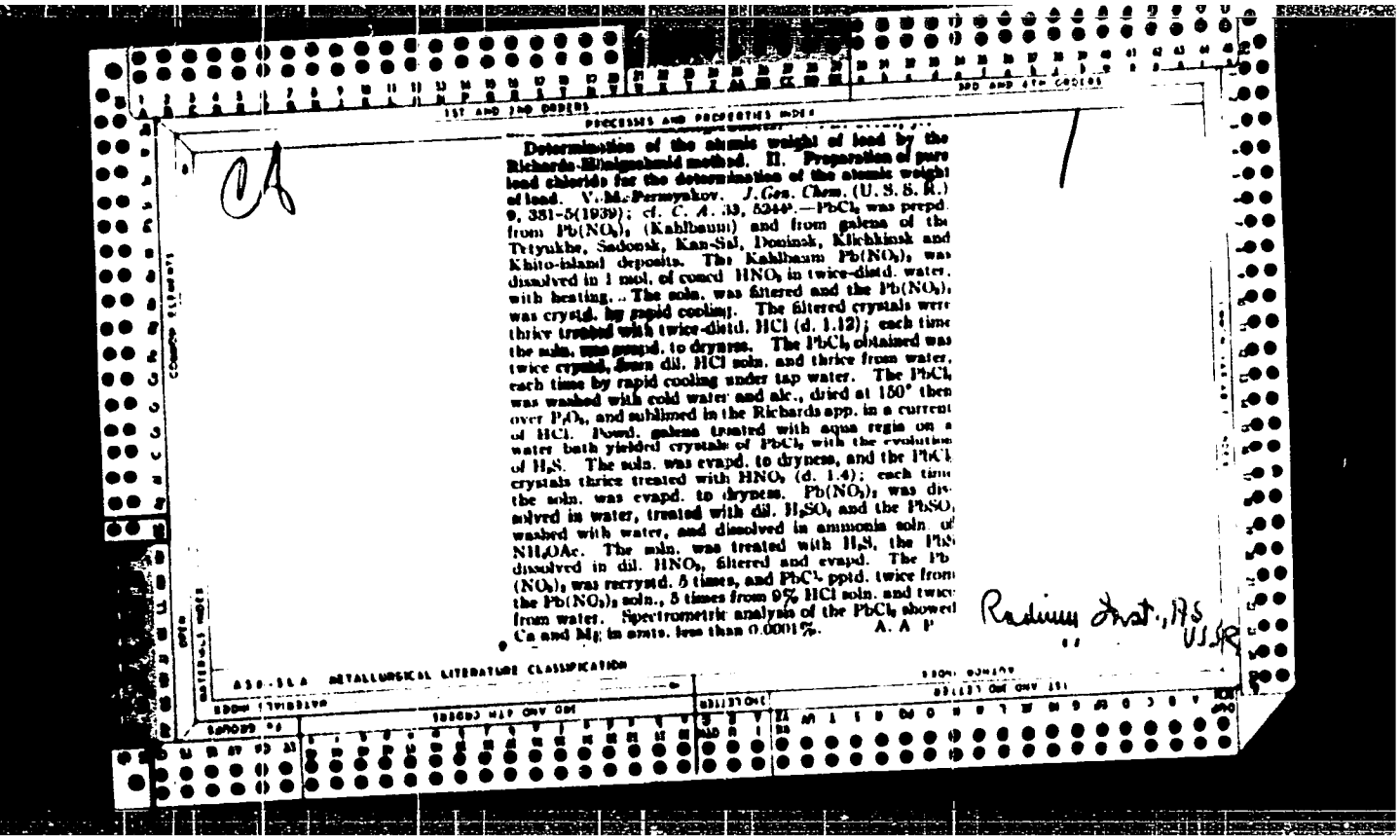


Materials chemically resistant to aluminate solutions stored under conditions of production of alumina by the alkali method. V. M. Permyakov and M. L. Temarkina *Trans. State Inst. Applied Chem.* (U. S. S. R.) No 21, 19-23(1934).—In the prepn of alumina from nepheline by the action of alkal., the concn of free alkali in soln is 82-105 g. per l. In a study of resistance of materials to the action of these lyes, bars made from portland cement, from alumina and from fine-grained concrete disintegrated readily. Sand-free portland and alumina cement samples were kept in alk. soln., contg 17 g KOH and 35 g. NaOH per l. also in aluminate solns contg 60 g. Al_2O_3 per l., at 80°. The portland cement was resistant to the alk. soln., but in the aluminate soln it showed an av. increase in wt. of 30%, because of pptn of $Al(OH)_3$ on the samples. The alumina cement showed 23.3% loss in wt. in the alk. soln. and a considerable increase in wt. in the aluminate soln. Metlah tiles, prepd at the Krupskaya plant, resisted aluminate lyes contg about 110 g. Na_2O and 108 g. Al_2O_3 per l., and no pptn of $Al(OH)_3$ appeared even after 40 hrs. The tiles can be held together with portland cement contg. the least possible admixt. of pulverized sand (screen No. 900, 1225 holes/sq. cm.)

S. I. Madorsky

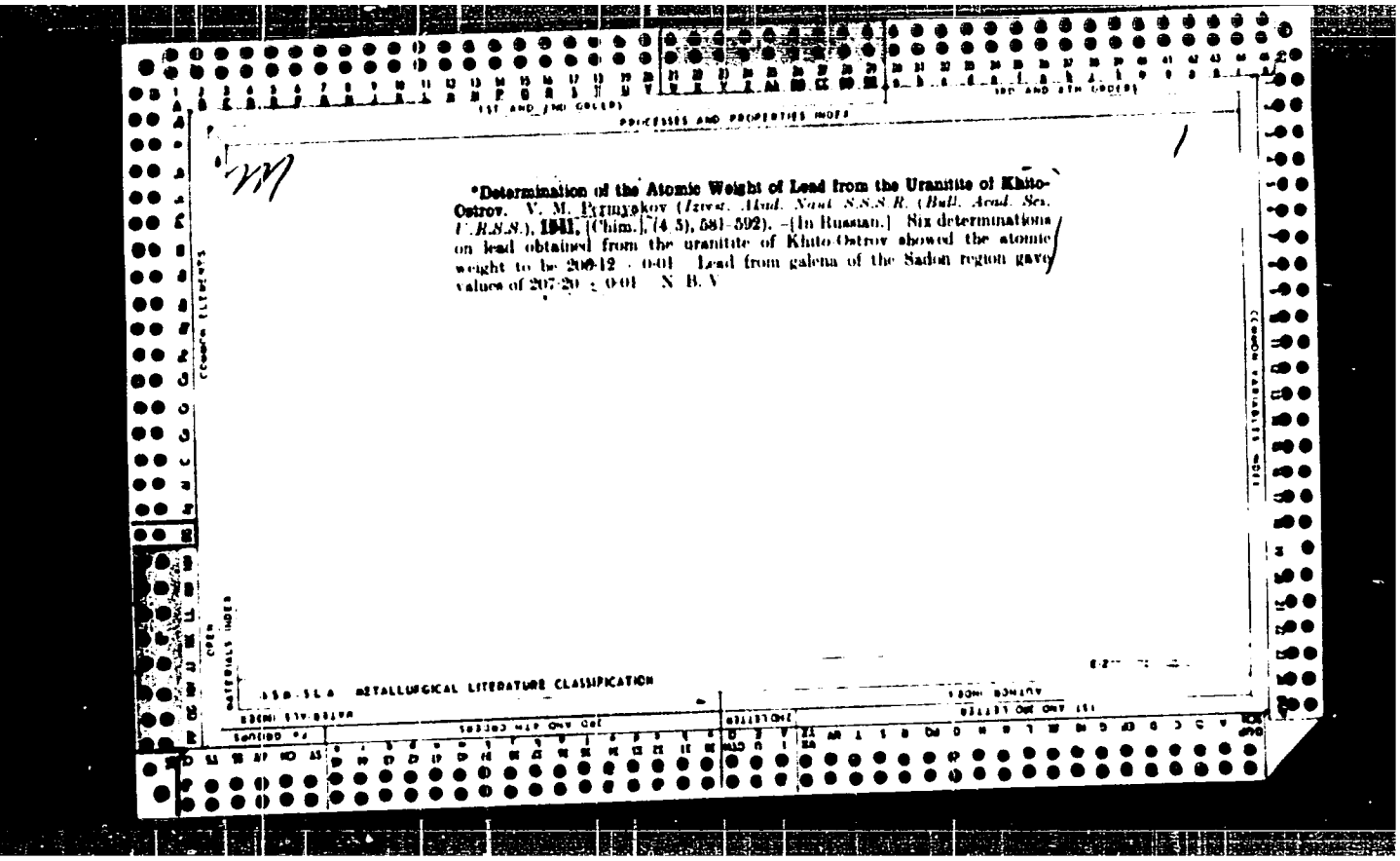


Determination of the atomic weight of lead by the Richards-Hönigschmid method. I. Preparation of chemically pure silver as a standard for determination of the atomic weight of lead. V. M. Primyakov. *J. Gen. Chem.* (U. S. S. R.) 8, 1891-6(in English, 1890) (1938).—Pure Ag contg. only 0.0003-0.0005% Cu and suitable for at.-wt. detns. is prepd. by the method of Hönigschmid (*C. A.* 9, 3020). John Livak

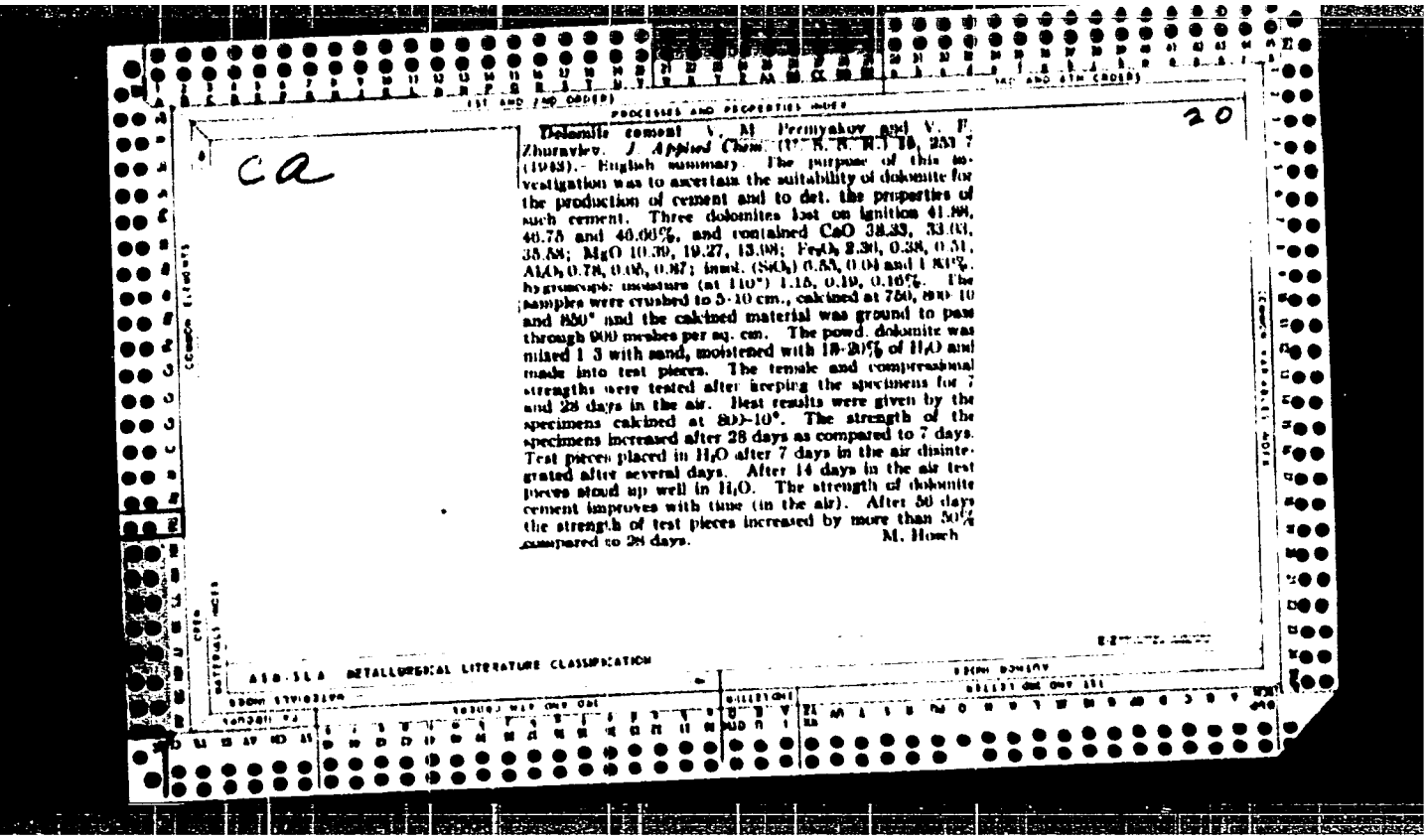


Determination of the atomic weight of lead by the Richards-Hönigschmid method. II. Preparation of pure lead chloride for the determination of the atomic weight of lead. V. M. Peresypkov. *J. Gen. Chem.* (U. S. S. R.) 9, 381-5(1939); cf. *C. A.* 33, 5244⁸.—$PbCl_2$ was prepd. from $Pb(NO_3)_2$ (Kahlbaum) and from galena of the Tetyukhe, Sadonsk, Kan-Sai, Dominsk, Klichkinsk and Khito-island deposits. The Kahlbaum $Pb(NO_3)_2$ was dissolved in 1 mol. of concd HNO_3 in twice-distd. water, with heating. The soln. was filtered and the $Pb(NO_3)_2$ was crystd. by rapid cooling. The filtered crystals were thrice washed with twice-distd. HCl (d. 1.12); each time the soln. was evapd. to dryness. The $PbCl_2$ obtained was twice crystd. from dil. HCl soln. and thrice from water, each time by rapid cooling under tap water. The $PbCl_2$ was washed with cold water and alc., dried at 150° then over P_2O_5, and sublimed in the Richards app. in a current of HCl. Powd. galena treated with aqua regia on a water bath yielded crystals of $PbCl_2$ with the evolution of H_2S. The soln. was evapd. to dryness, and the $PbCl_2$ crystals thrice treated with HNO_3 (d. 1.4); each time the soln. was evapd. to dryness. $Pb(NO_3)_2$ was dissolved in water, treated with dil. H_2SO_4 and the $PbSO_4$ washed with water, and dissolved in ammonia soln. of NH_4OAc. The soln. was treated with H_2S, the PbS dissolved in dil. HNO_3, filtered and evapd. The Pb $(NO_3)_2$ was recryst'd. 5 times, and $PbCl_2$ ppt'd. twice from the $Pb(NO_3)_2$ soln., 5 times from 9% HCl soln. and twice from water. Spectrometric analysis of the $PbCl_2$ showed Ca and Mg in amts. less than 0.0001%. A. A. P

Radium Inst., AS USSR



*Determination of the Atomic Weight of Lead from the Uranitite of Khito-Ostrov. V. M. Peyngakov (*Izvest. Akad. Nauk S.S.S.R. (Bull. Acad. Sci. U.R.S.S.)*, **1941**, (Chim.), (4-5), 581-592). -[In Russian.] Six determinations on lead obtained from the uranitite of Khito-Ostrov showed the atomic weight to be 206·12 ± 0·01. Lead from galena of the Sadon region gave values of 207·20 ± 0·01. N. B. V.



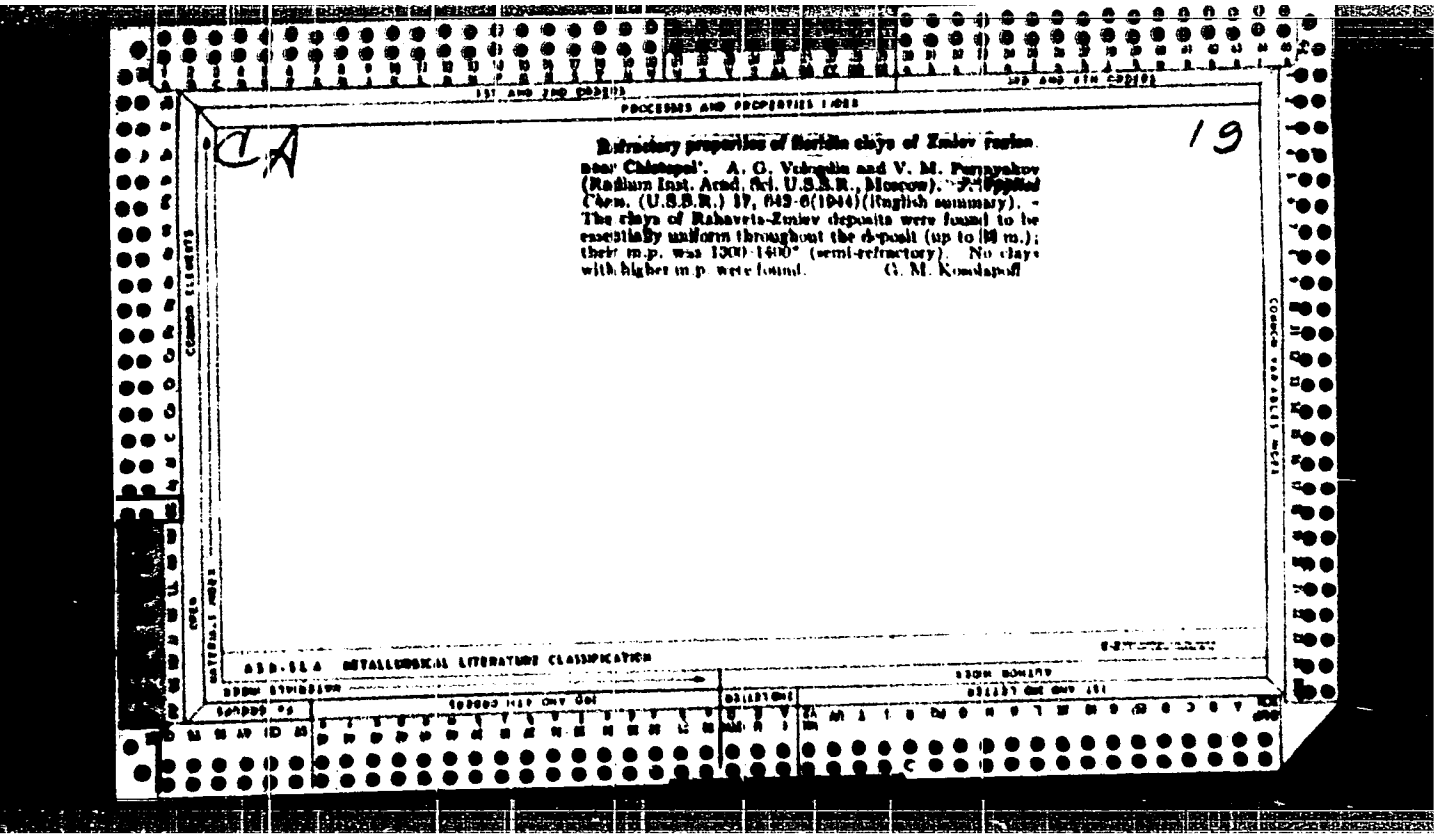
ca

20

Dolomite cement. V. M. Pevnyakov and V. F. Zhuravlev. *J. Applied Chem.* (U.S.S.R.) 16, 253-7 (1943).- English summary. The purpose of this investigation was to ascertain the suitability of dolomite for the production of cement and to det. the properties of such cement. Three dolomites lost on ignition 41.88, 40.75 and 40.00%, and contained CaO 38.33, 33.03, 35.58; MgO 10.30, 19.27, 13.08; Fe_2O_3 2.30, 0.38, 0.51, Al_2O_3 0.78, 0.05, 0.87; insol. (SiO_2) 0.55, 0.04 and 1.81%. hygroscopic moisture (at 110°) 1.15, 0.19, 0.16%. The samples were crushed to 5-10 cm., calcined at 750, 800-10 and 850° and the calcined material was ground to pass through 900 meshes per sq. cm. The powd. dolomite was mixed 1:3 with sand, moistened with 18-20% of H_2O and made into test pieces. The tensile and compressional strengths were tested after keeping the specimens for 7 and 28 days in the air. Best results were given by the specimens calcined at 800-10°. The strength of the specimens increased after 28 days as compared to 7 days. Test pieces placed in H_2O after 7 days in the air disintegrated after several days. After 14 days in the air test pieces stood up well in H_2O. The strength of dolomite cement improves with time (in the air). After 50 days the strength of test pieces increased by more than 50% compared to 28 days.

M. Hosch

A50-51A METALLURGICAL LITERATURE CLASSIFICATION



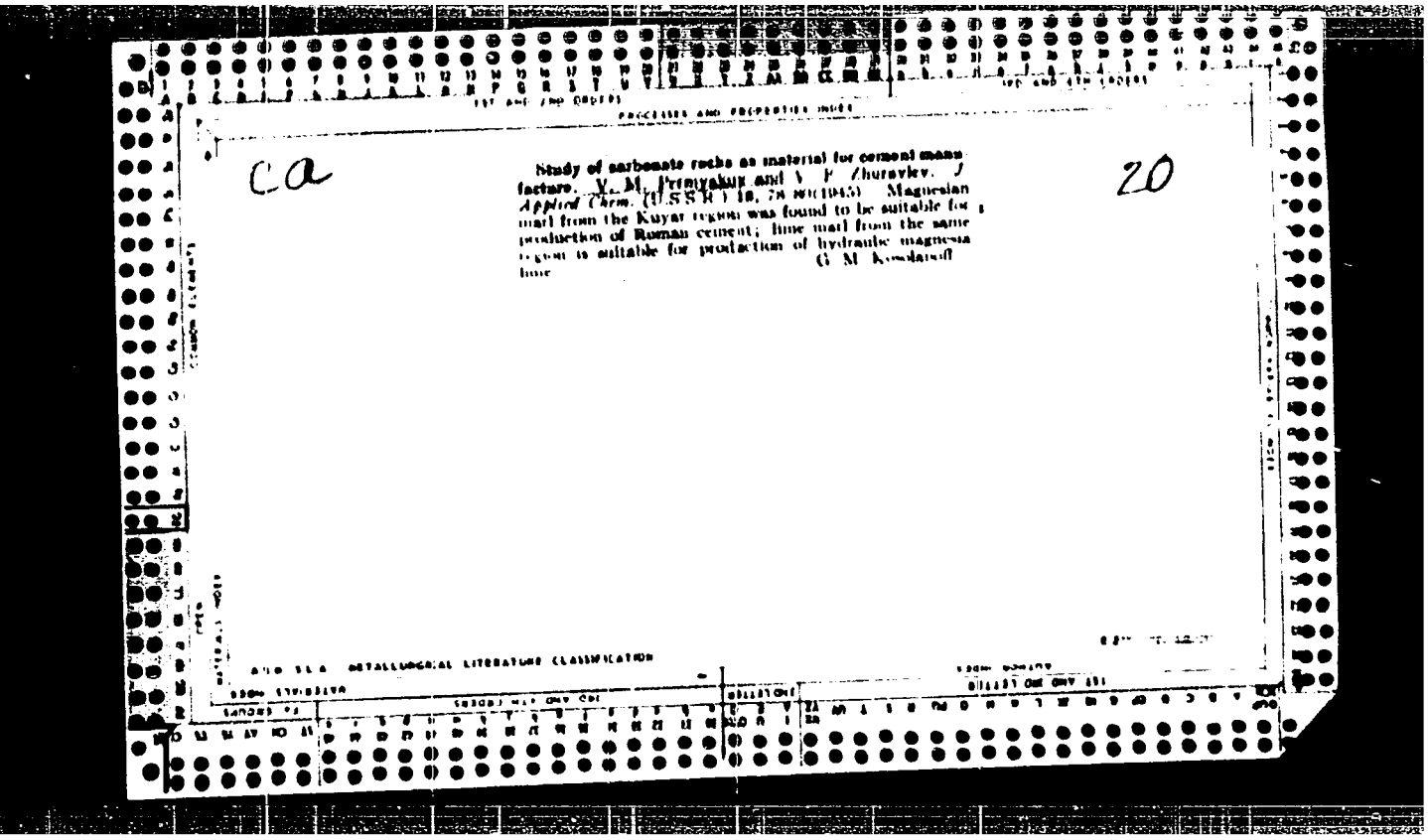
CA

19

PROCESSES AND PROPERTIES INDEX

Refractory properties of Berlin clays of Zmiev region near Chistopol'. A. G. Vobornin and V. M. Pamyatnov (Radium Inst. Acad. Sci. U.S.S.R., Moscow). Zhur. Prikladnoi Khim. (U.S.S.R.) 17, 643-6(1944)(English summary). - The clays of Rabaveta-Zmiev deposits were found to be essentially uniform throughout the deposit (up to 10 m.); their m.p. was 1300-1400° (semi-refractory). No clays with higher m.p. were found. G. M. Kondaguff

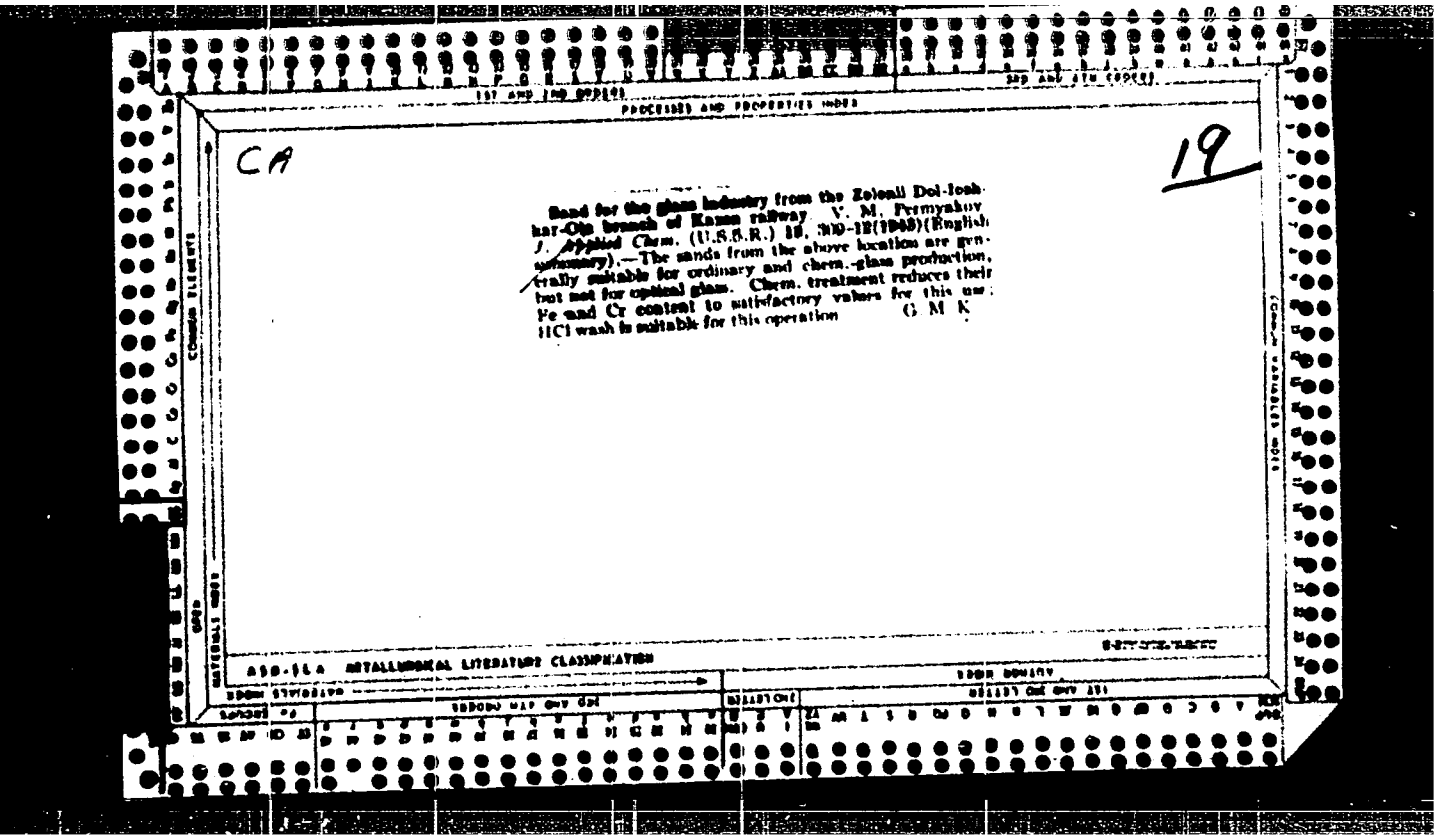
A 53-54 A METALLURGICAL LITERATURE CLASSIFICATION



Ca

Study of carbonate rocks as material for cement manufacture. V. M. Izmyakur and V. F. Zhuravlev. *Applied Chem.* (U.S.S.R.) 18, 78 MC(1945). Magnesian marl from the Kuyar region was found to be suitable for production of Roman cement; lime marl from the same region is suitable for production of hydraulic magnesia lime. G. M. Kondratieff

20



CA

19

Sand for the glass industry from the Zolouli Dol-Ioshkar-Ola branch of Kazan railway. V. M. Premyakov *J. Applied Chem.* (U.S.S.R.) 18, 309-12(1945)(English summary).—The sands from the above location are generally suitable for ordinary and chem.-glass production, but not for optical glass. Chem. treatment reduces their Fe and Cr content to satisfactory values for this use. HCl wash is suitable for this operation G M K

PERMYAKOV, V.M.

Lead method for determining the geological age of certain minerals and rocks from Khibin and the northern districts of the Karelian A.S.S.R. Trudy Radiev. inst. AN SSSR 5 no.2:203-216 '57.
(Karelia--Minerals) (Geological time) (MLRA 10:8)

AUTHORS: Komaishko, G.S., Matviyenko, V. I., SOV/89-5-1-6/28
Pernyakov, V. M., Subbotin, Ye. S., Feofilov, O.G.

TITLE: On Some Methods Employed for the Mass Production of Po-α-Be Neutron Sources (O nekotorykh metodakh massovogo izgotovleniya Po-α-Be neytronnykh istochnikov)

PERIODICAL: Atomnaya energiya, 1958, Vol. 5, Nr 1, pp. 64-67 (USSR)

ABSTRACT: For the production of Po-α-Be neutron sources one of the wet methods is, above all, described. This method consists in the production of a uniform mixture of polonium and beryllium by causing a polonium solution combined with nitric acid to act upon beryllium powder. The mixture obtained is dried and pulverized. A method is described by means of which it is possible to obtain nitric acid polonium free from a copper carrier. In view of its high degree of neutron activity existing during the entire technical production process, the method described is, however unsuited for the mass production of the preparation concerned. For mass production a method developed by Brean, Hertz, which was improved by the authors, is very well suited. Copper powder

Card 1/2

On Some Methods Employed for the Mass Production of Po-α-Be Neutron Sources

SOV/89-5-1-6/28

containing a known quantity of polonium 210 is weighed into a container, which is then filled with beryllium powder. During the following heating of the hermetically closed container the polonium is sublimated, after which it is uniformly distributed in the mixture. By employing this method it is possible, without any danger to the operating staff, to produce neutron preparations up to $2,1 \pm 0,2 \times 10^6$ n/sec from 1 C polonium 210. There are 2 figures and 7 references, 1 of which is Soviet.

SUBMITTED: June 17, 1957

1. Neutrons--Sources 2. Mixtures--Preparation 3. Polonium --Properties 4. Copper powder--Properties 5. Beryllium powder --Properties

Card 2/2

PERMYAKOV, V.M.

Comparative evaluation of the methods for preparing radium-beryllium sources. Radiokhimiia 2 no.6:255-258 '60. (MIRA 14:4)
(Neutrons)
(Radium)
(Beryllium)

24399
S/186/60/002/002/020/022
B071/B433

21.4100

AUTHOR: Permyakov, V.M.

TITLE: A comparative evaluation of methods of preparation of radium-beryllium sources

PERIODICAL: Radiokhimiya, 1960, Vol.2, No.2, pp.255-258

TEXT: The following methods of preparation of the neutron Ra-α-Be sources are considered: 1) wet method of mixing in the form of sulphate - developed by A.Ye.Polesitskiy and A.P.Ratner (Ref.7: DAN SSSR, 24, 249 (1939)); 2) dry method of mixing in the form of sulphate; 3) mixing of metallic beryllium moistened with methyl alcohol with a solution of radium-barium bromide, evaporation on a water bath to remove the main mass of water and the drying at 200 to 250°C; the powder formed is transferred into containers; 4) as in 3 but compressing in a special container under a pressure of about 300 kg/cm^2 to a density of about 1.75 kg/cm^3; 5) chemical method in the form of $RaBeF_4$. The methods of preparation are described in some detail. It is considered that the above methods, with the exception of the chemical method (5) give the same amount of neutrons per 1 g of radium. Methods (3) and (4) are the best in respect of the output

Card 1/3

of neutrons as well as from the point of view of safety in preparation. In order to prevent possible emanation, the sources should be sealed in a glass container made from a chemically stable glass, free from boron. The chemical method (5) of preparation gives an ideal mixing of radium and beryllium. It permits the preparation of sources with a well reproducible output of neutrons. However, due to the low relative concentration of beryllium in the source, the output of neutrons is 4 to 6 times lower than from sources prepared by other methods. The wet method of preparation in the form of sulphates giving a good output of neutrons (107) can be recommended only with the necessary safety precautions and automation and mechanization of the individual stages of preparation. The dry method of preparation in the form of sulphate produces a large amount of active dust and is not recommended.
The advice of I.Ye.Starik is acknowledged. There are 11 references: 3 Soviet-bloc and 8 non-Soviet-bloc. Four of the references to English language publications read as follows:
G.A.Fink, Phys.Rev., 50, 738 (1936); F.G.P.Seidl and S.P.Harris, Rev.Sci.Instr., 18, 897 (1947); H.L.Anderson and B.F.Feld, Rev. Sci.Instr., 18, 186 (1947); E.Bretscher, G.B.Cook, G.R.Martin and

24399

S/186/60/002/002/020/022
E071/E433

A comparative evaluation ...

D.H.Wilkinson, Proc.Roy.Soc., 196, 436 (1949).

SUBMITTED: July 7, 1959

Card 3/3

CHELYSHEV, N.A.; PERMYAKOV, V.M.; KAPTANOV, M.P.; ZAYKOV, M.A.; KAMINSKIY, D.M.; ZAKHARENKO, N.I.; PROKOP'YEV, A.V.

Characteristics of rolling rail steel ingots at the Kuznetsk blooming mill. Izv.vys.ucheb.zav.; chern.met. 8 no.8:94-101 '65. (MIRA 18:8)

1. Sibirskiy metallurgicheskiy institut.

ZAYKOV, M.A.; TSELUYKOV, V.S.; KAMINSKIY, D.M.; DADOCHKIN, N.V.; MESHCHERYAKOV, P.A.; MARININ, P.G.; MIRENSKIY, M.L.; PROKOP'YEV, A.V.; OVCHINNIKOVA, R.F.; Prinimali uchastiye; BELYAVSKIY, M.A.; KAFTANOV, M.P.; KUCHKO, I.I.; LAR'KINA, F.Ye.; MANCHEVSKIY, I.V.; MARAMYGIN, G.F.; MERKUTOV, V.N.; NASIBULIN, A.S.; NEFEDOV, M.K.; PERMYAKOV, V.M.; CHELYSHEV, N.A.; CHVANOV, L.K.

Investigating conditions of rolling on three-high billet mills. Izvy vys. ucheb. zav.; chern. met. 6 no.10:74-83 '63. (MIRA 16:12)

1. Sibirskiy metallurgicheskiy institut i Kuznetskiy metallurgicheskiy kombinat.

FERMYAKOV, V.M.; GORSHKOV, G.V., otv. red.; ARON, G.M., red.izd-va; ZAMAGAYEVA, R.A., tekhn. red.

[Radioactive emanations] Radioaktivnye emanatsii. Moskva, Izd-vo AN SSSR, 1963. 174 p. (MIRA 16:12)
(Radioactive substances)

ZAYKOV, M.A., kand.tekhn.nauk, dotsent; TSELUIKOV, V.S., inzh.; KAMINSKIY, D.M., kand.tekhn.nauk, dotsent; PERETYAT'KO, V.N., inzh.; KAFTANOV, M.P., inzh.; PERMYAKOV, V.M., inzh.; PROKOP'YEV, A.V., inzh.

Investigating and improving cogging conditions of sheet rolling mills. Izv. vys. ucheb. zav.; chern.met. no.5:131-144 My '58. (MIRA 11:7)

1.Sibirskiy metallurgicheskiy institut.
(Rolling mills)

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Automatic measurement of forces in rolling as basis for improving the conditions of reduction. Izv.vys.ucheb.zav.; chern.met. 2 no.6:53-62 Je '59. (MIRA 13:1)

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TITLE: Rationalization of the reduction schedule of a medium gage shut mill on the basis of an automatic recording of the rolling stresses

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 7, 1961, 6, abstract 7D34 ("Tr. Konferentsii: Tekhn. progress v tekhnol. prokatn. proiz-va". Sverdlovsk, Metallurgizdat, 1960, 501-509)

TEXT: An investigation was carried out on the stress measurements of a medium gage sheet mill consisting of two successive Lauth three-high stands. Stress measuring instruments with high impedance resistance sensors and an electronic automatic poteniometric recorder were used for this purpose. As the original impulse the elastic stretching deformation of the frame pedestals during the passage of metal between the rolls was used. The analysis of the results of the investigation and calculations have shown that the optimal reduction schedule is, in the main, determined only by the rolling stress admissible according to the strength conditions of the main parts of the working stand. Depending on the value of strain resistance, the grading of the mill is divided

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